Håfa Adai and Good Morning!

The BOEM Guam Intergovernmental Renewable Energy Task Force Meeting will begin at 10:00 am ChST.

Visit boem.gov/Guam for meeting materials or scan the QR code.

If you are attending in-person, please sign in at the welcome table.

If you need technical assistance during the meeting, please email Eunice at Elee@kearnswest.com.

Because this is not a Federal Advisory Committee, only governmental entities and elected officials are able to be included. However, BOEM has set up an opportunity for members of the public to attend the meeting and provide input after the meeting has adjourned.

BOEM BUREAU OF OCEAN ENERGY MANAGEMENT

BOEM Guam Intergovernmental Renewable Energy Task Force Meeting

September 11, 2024

10:00 a.m. – 3:00 p.m. ChST

For help with technical difficulties, please email Elee@kearnswest.com for assistance.
The webinar will be recorded.

Inifresi

Ginen i mas takhelo' gi Hinasso-ku,
i mas takhalom gi Kurason-hu,
yan i mas figo' na Nina'siñå-hu,
Hu ufresen maisa yu' para bai hu Prutehi
yan hu Difende i Hinengge,
i Kottura,
i Lengguahi,
i Aire,
i Hanom yan i tano' Chamoru,
ni'Irensiå-ku Direchu ginen as Yu'os Tåta.
Este hu Afitma gi hilo' i bipblia yan i banderå-hu,
i banderan Guåhan.

From the highest of my thoughts,
from the deepest of my heart,
and with the utmost of my strength,
I offer myself to protect
and to defend the beliefs,
the culture,
the language,
the air,
the water and the land of the Chamorro,
which are our inherent God-given rights.
This I will affirm by the holy words and our banner,
the flag of Guåhan!

Opening Remarks

Doug Boren, BOEM Pacific Regional Director

Opening Remarks

Lieutenant Governor Joshua Tenorio, Guam Governor's Office

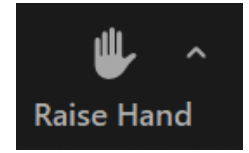
Task Force Meeting Overview

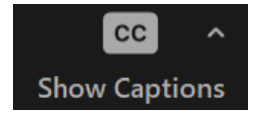
Participation Ground Rules

- Honor the agenda.
- Participate actively and respectfully.
- Respect differences of opinion and perspectives.
- Provide your name and affiliation each time you speak.
- Be mindful of your speaking time.
- Refrain from sidebar conversations.
- Ask to learn, listen to understand.
- Be tough on the issues, soft on the people.

Instructions – Task Force Members

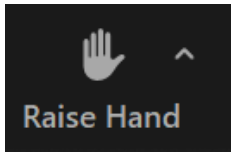
- Mute yourself when not speaking. Refrain from sidebar conversations.
- To enter the discussion queue:
  - **Place your name card on its side.** Please lower your card once you are done speaking.
  - **Use the "Raise your hand" button or press *9 on your phone.** Please lower your hand once you are done speaking.
    - If unable to speak, use the chat for technical assistance.
- The chat is reserved for technical difficulties. You can also contact Eunice at Elee@kearnswest.com.
- Task Force members are encouraged to keep their webcam on during introductions and discussions.
- Closed Captioning and ASL Interpretation is available.

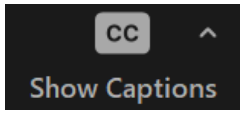




Instructions – Public Attendees

- Public attendees will be muted throughout the webinar and will not be able to unmute themselves until the Public Perspectives and Q&A agenda item.
- Public attendees can ask questions during the Public Perspectives and Q&A opportunity at 3:00 p.m. ChST
  - To enter the queue:
  - **Sign-up at the Public Attendee Table to receive a number.**
  - **Use the "Raise Hand" button or press *9 on your phone.** Please lower your hand once you are done speaking.
  - The Q&A pod feature will be available to share input.
- Closed Captioning and ASL interpretation is available.
- For technical assistance requests, contact Elee@kearnswest.com





Meeting Objectives

- Introduce Task Force members to the BOEM's:
  - Task Force purpose and roles
  - Regulatory framework and renewable energy leasing process
  - Studies program and BOEM/NOAA NCCOS process
- Provide information on floating wind technology
- Provide an overview of Guam's renewable energy goals
- Outline next steps for offshore wind planning offshore Guam

Agenda

Time	Item	Presenter
10:00 – 10:10 a.m.	**Welcome and Opening Remarks**	Jamie Damon, Facilitator Doug Boren, BOEM Lieutenant Governor Joshua Tenorio, Guam Governor's Office
10:10 – 10:25 a.m.	**Task Force Meeting Overview**	Jamie Damon, Facilitator
10:25 – 10:30 a.m.	**BOEM Task Force Purpose and Overview**	Deanna Meier, BOEM
10:30 – 10:45 a.m.	**Floating Offshore Wind 101**	Amy Robertson, NREL
10:45 – 10:55 a.m.	**Guam's Renewable Energy Goals**	John J. Cruz, Guam Power Authority
10:55– 11:15 a.m.	**Overview of BOEM Regulatory Framework and Leasing Process**	Deanna Meier, BOEM
11:15 a.m. – 12:00 p.m.	**Discussion on BOEM and Guam Presentations**	All
12:00 p.m. – 1:00 p.m.	*Lunch Break*	

Agenda

Time	Item	Presenter
1:00 – 1:15 p.m.	**Overview of BOEM Studies Program and Region-specific Studies Underway**	Dave Pereksta, BOEM
1:15-1:30 p.m.	**NOAA Presentation: NCCOS Spatial Modeling Process**	James Morris, NOAA NCCOS
1:30 – 1:55 p.m.	**Clarifying Questions on BOEM Studies and NCCOS Presentations**	All
1:55 – 2:05 p.m.	*Break*	
2:05 – 2:45 p.m.	**Other Task Force Member Comments and Discussion**	All
2:45 – 2:50 p.m.	**Closing Remarks**	Doug Boren, BOEM Lester Carlson, Guam Bureau of Budget Management and Research
2:50 – 3:00 p.m.	*Break*	
3:00 – 4:00 p.m.	**Public Perspectives and Questions & Answers**	
4:00 p.m.	*Adjourn*	

BOEM Staff Present Today

- **Doug Boren,** Pacific Regional Director
- **Necy Sumait,** Office of Strategic Resources Regional Supervisor
- **Jennifer Miller,** Renewable Energy Section Chief
- **Deanna Meier,** Renewable Energy Specialist
- **Dave Pereksta**, Avian Biologist
- **Rockne Rudolph,** GIS Specialist
- **Frank Pendleton,** GIS Analyst

Task Force Member Introductions – Guam

- Bureau of Statistics and Plans
- Consolidated Commission on Utilities
- CHamoru Land Trust Commission (Department of Land Management)
- Department of Agriculture
- Department of Land Management
- Division of Aquatic Resources and Wildlife Resources
- Guam Environmental Protection Agency
- Guam Power Authority
- Office of the Governor (Bureau of Budget and Management Research)
- Port Authority of Guam

Task Force Member Introductions – Federal Representatives

- Bureau of Ocean Energy Management (BOEM)
- Bureau of Safety and Environmental Enforcement (BSEE)
- Department of Defense (DOD)
- Department of Energy (DOE)
- Federal Aviation Administration (FAA)
- Federal Communications Commission (FCC)
- Federal Energy Regulatory Commission (FERC)
- National Park Service (NPS)
- National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS), Pacific Islands Regional Office (PIRO)
- NOAA NMFS, Pacific Islands Fisheries Science Center (PIFSC)
- Small Business Administration (SBA)
- U.S. Army Corps of Engineers (USACE)
- U.S. Coast Guard (USCG)
- U.S. Environmental Protection Agency (EPA), Region 9
- U.S. Fish and Wildlife Service (USFWS)
- U.S. Geological Survey (USGS)

BOEM BUREAU OF OCEAN ENERGY MANAGEMENT

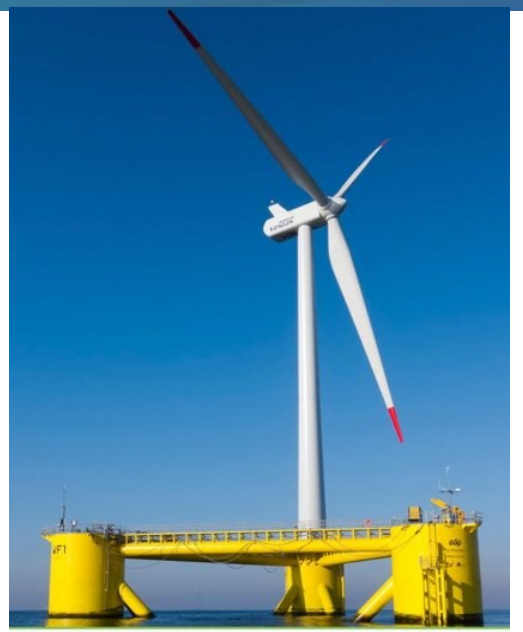
Background and Overview

BOEM Guam Intergovernmental Renewable Energy Task Force Meeting #1

Deanna Meier | September 11, 2024

Intergovernmental Renewable Energy Task Force Overview

- Background
- Purpose
- Roles
- Membership



Intergovernmental Renewable Energy Task Force

In 2024, Guam's Governor, the Honorable Lourdes Aflague Leon Guerrero requested the formation of the BOEM Guam Intergovernmental Renewable Energy Task Force (Task Force)

Task Force Charter:

- Finalized on April 13, 2024
- Defines the Task Force as neither a decision-making nor an approval body nor acting on behalf of a decision-making or approval body

The Task Force provides a forum for the following:

- Educate members about the renewable energy program, processes, and requirements
- Exchange data and information
- Discuss issues
- Inform federal government decision-making within the umbrella of the established BOEM regulatory framework regarding renewable energy leasing and development on the OCS off the coast of Guam

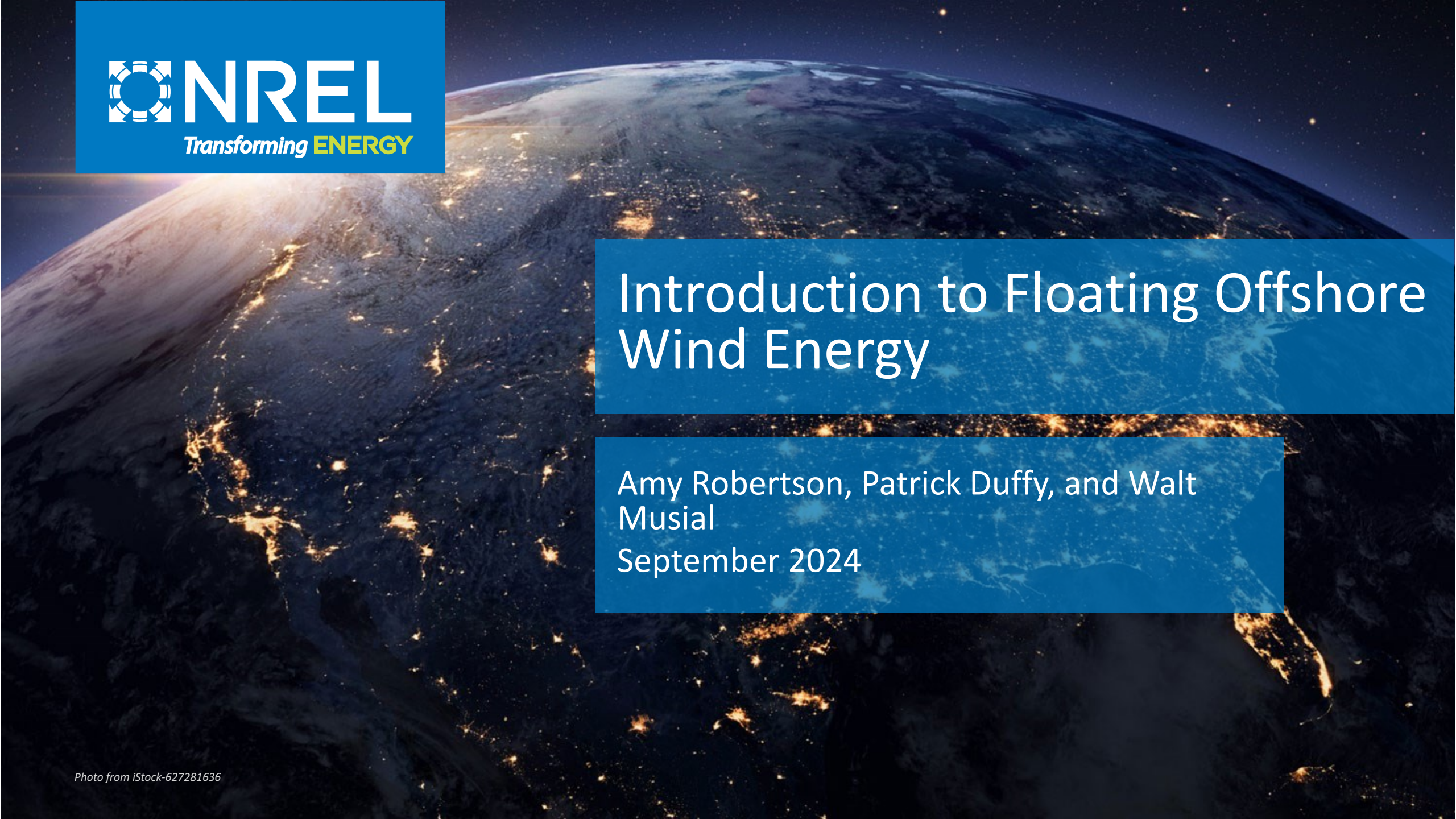
Intergovernmental Renewable Energy Task Force

The Task Force is comprised of the following:

- Federal agency officials
- GOVGUAM agency officials
- Local agency officials

Current Task Force Member Agencies (in alphabetical order)

- GOVGUAM Agencies
  - Bureau of Statistics and Plans
  - CHamoru Land Trust Commission
  - Department of Agriculture
  - Division of Aquatic Resources and Wildlife Resources
  - Guam Environmental Protection Agency
  - Guam Power Authority
  - Office of the Governor
  - Port Authority of Guam
  - Consolidated Commission on Utilities
- Federal Agencies
  - Bureau of Ocean Energy Management
  - Bureau of Safety and Environmental Enforcement
  - Department of Defense
- Federal Agencies, continued
  - Department of Defense
  - Department of Energy
  - Environmental Protection Agency
  - Federal Aviation Administration
  - Federal Communications Commission
  - Federal Energy Regulatory Commission
  - National Park Service
  - National Oceanic and Atmospheric Administration
  - Small Business Administration
  - U.S. Army Corps of Engineers
  - U.S. Coast Guard
  - U.S. Fish and Wildlife Service
  - U.S. Geological Survey



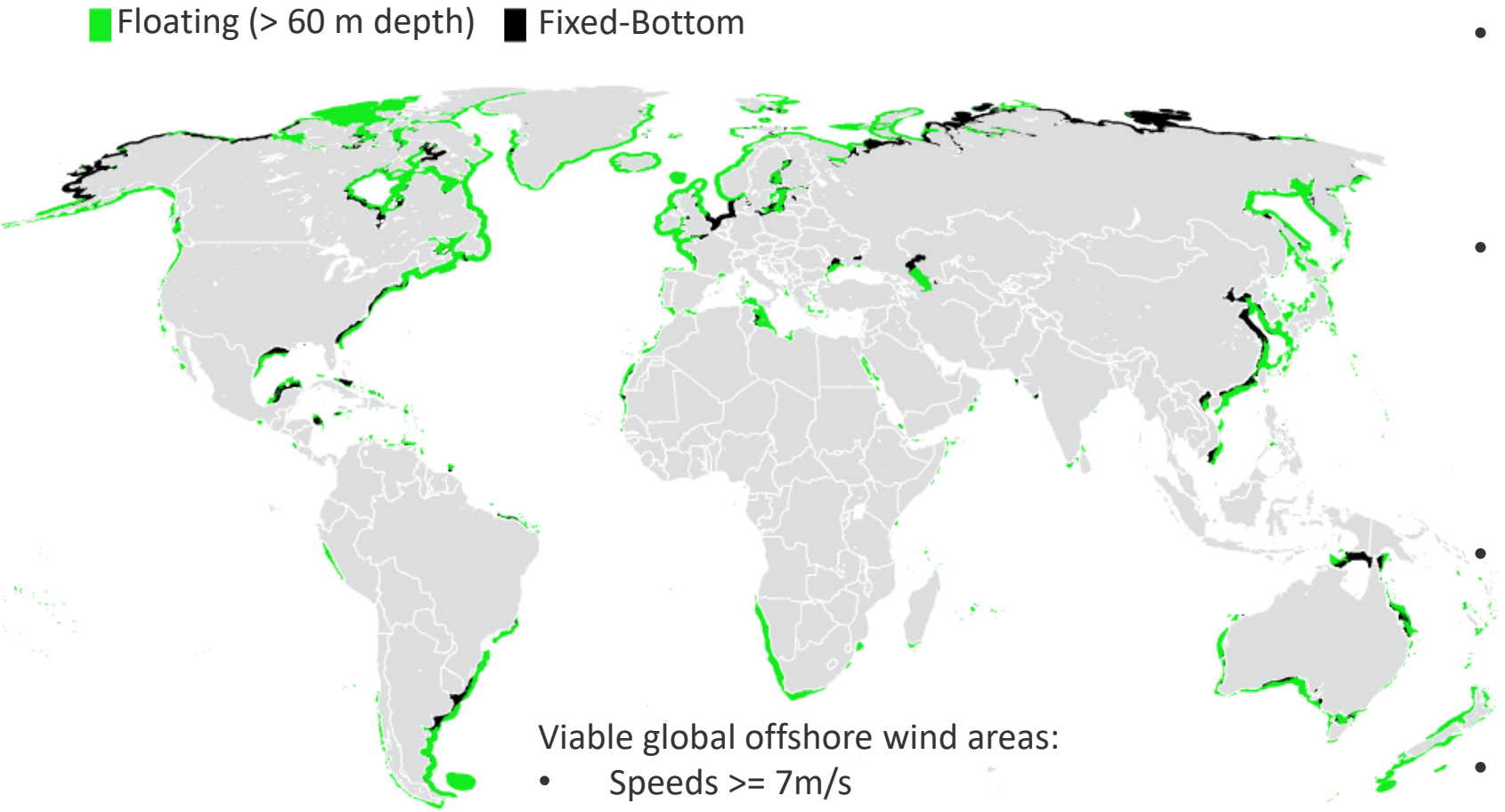
Introduction to Floating Offshore Wind Energy

Amy Robertson, Patrick Duffy, and Walt Musial

September 2024

Photo from iStock-627281636

Why Pursue Floating Offshore Wind Energy?



Viable global offshore wind areas:

- Speeds >= 7m/s
- Within 55km and 200km from shoreline

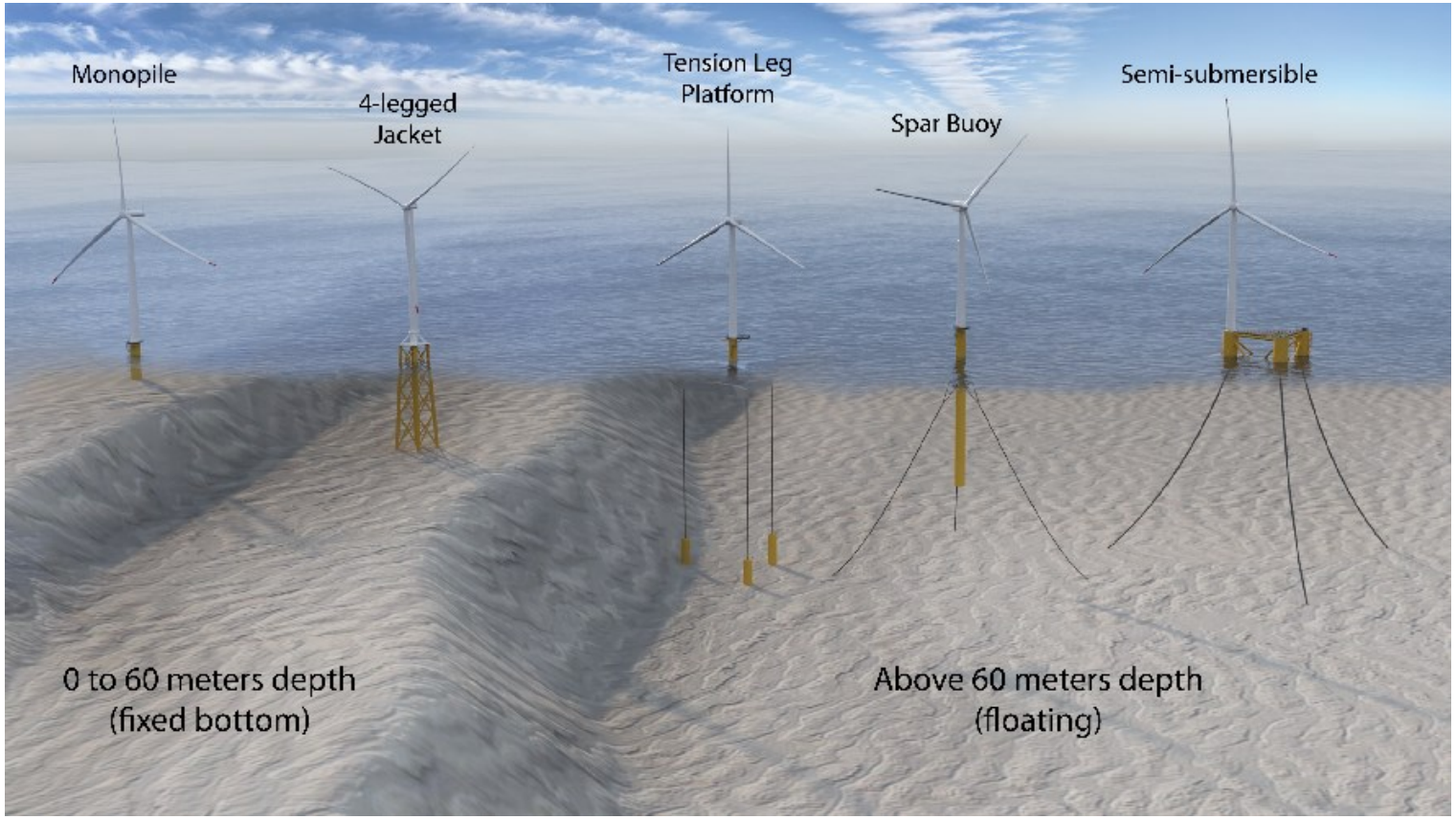
Image from: https://www.bloomberg.com/news/features/2020-06-05/floating-wind-farms-could-supply-the-world-s-electricity-by-2040

- To meet clean energy targets, both offshore and land-based wind will be needed – efficient use of the resource area is essential.
- Fixed bottom ocean space is already becoming scarce; floating wind enables sites in deeper waters (waters deeper than 60-m), that are also farther from shore, out of sight, and with better winds.
- In fact, more than 65% of the total offshore wind resource in the United States lies over these deeper waters and 80% in Europe.
- Commercial floating wind technology is expected to be deployed at utility-scale by the late 2020's but more research is needed to overcome technical and socio-economic barriers.

Most Offshore Wind Deployment Has Been on Fixed-Bottom Support Structures

Leading Offshore Wind Countries
(Installed Capacity)

China	33,423 MW
United Kingdom	14,795 MW
Germany	7,987 MW
Netherlands	3,762 MW
Denmark	2,309 MW
Belgium	2,262 MW



Figures from McCoy et al. (2024)

Fixed Bottom	Floating
68,258 MW Installed	234 MW Installed

The future floating wind energy market may be bigger than the fixed-bottom market

How does a wind turbine work?

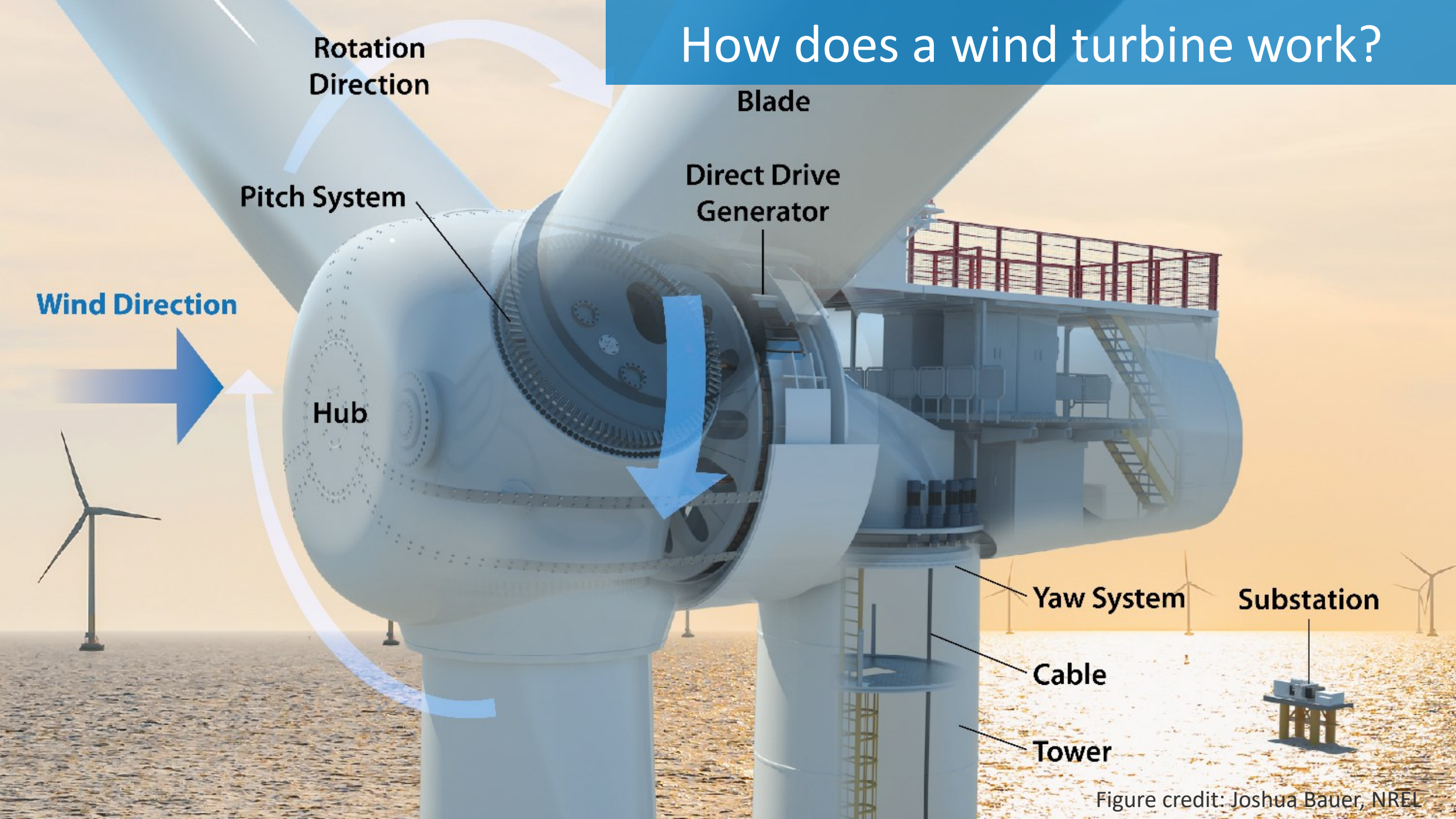


Figure credit: Joshua Bauer, NREL

All Floating Wind Platforms Rely on These Basic Archetypes

Spar:

Achieves stability through ballast (weight) installed below its main buoyancy tank.

Benefits: Simple and stable

Challenges:

- Deep drafts limit port access and siting

Semisubmersible:

Achieves static stability by distributing buoyancy at the water plane

Benefits: Shallow draft

Challenges:

- Higher exposure to waves
- More structure above the waterline

Tension-leg platform (TLP):

Achieves static stability through mooring line tension with a submerged buoyancy tank.

Benefits: Stable, small footprint

Challenges:

- Unstable during assembly
- High vertical load moorings/anchors

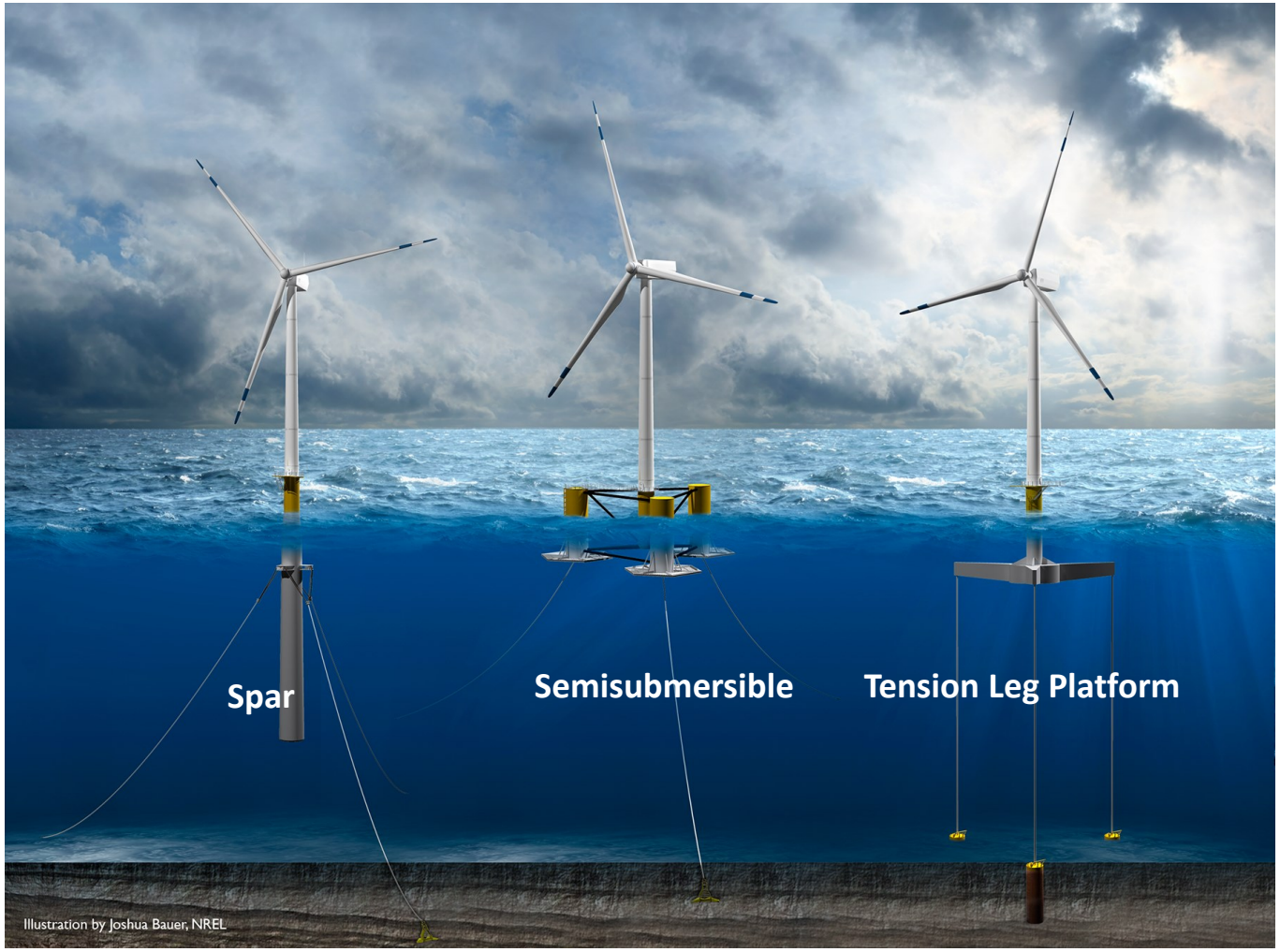
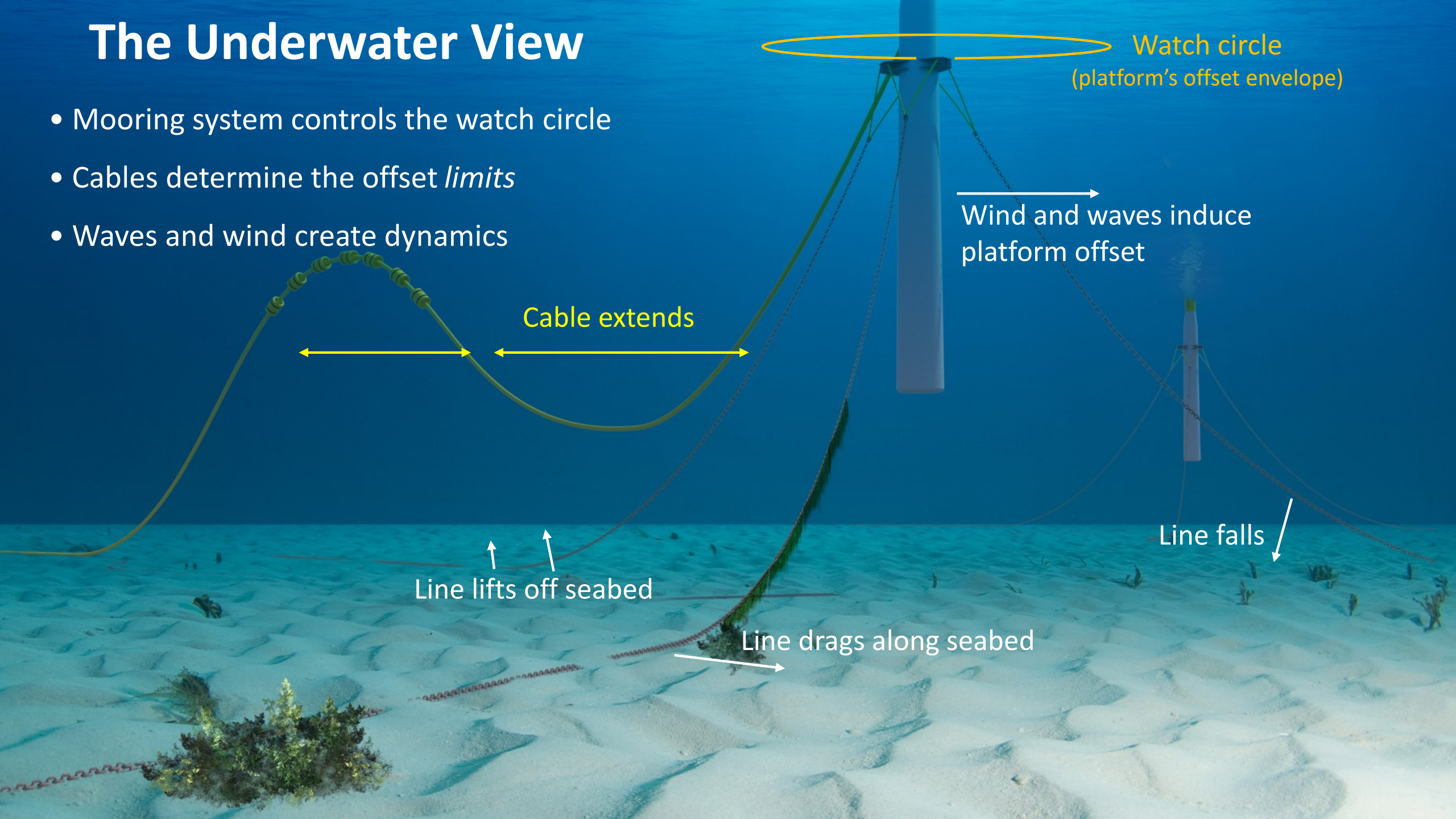
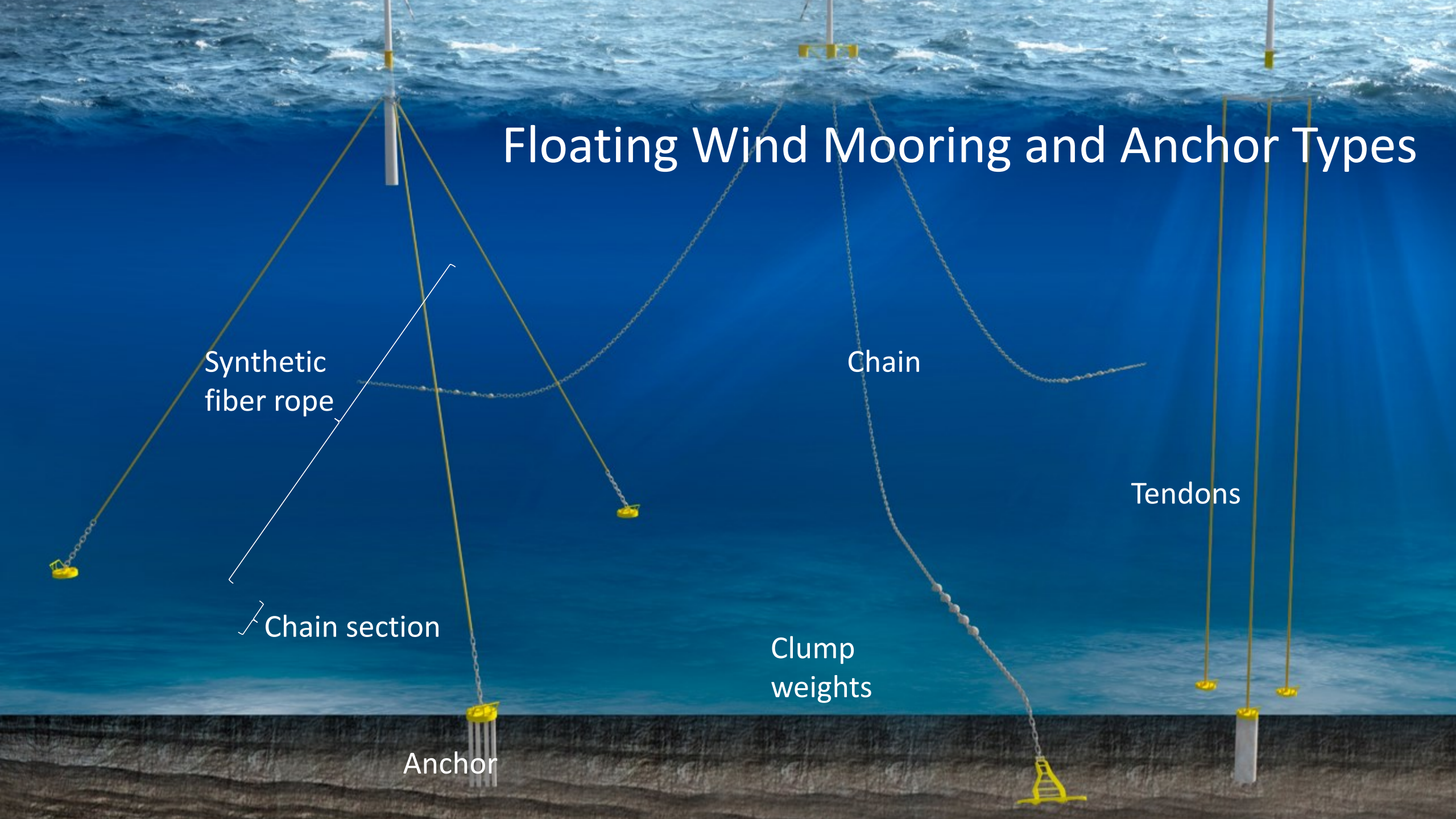


Figure credit: Joshua Bauer, NREL

The Underwater View

- Mooring system controls the watch circle
- Cables determine the offset *limits*
- Waves and wind create dynamics




Floating Wind Mooring and Anchor Types
Synthetic fiber rope
Chain
Tendons
Chain section
Clump weights
Anchor

Floating Offshore Wind Port and Infrastructure Requirements

Image by Harland and Wolff Heavy Industries

Wharf

Serial turbine, substructure assembly and component port delivery due to depth, waves off coast

Navigation Channel and Wet Storage

Storage and wet-tow out of assembled turbines with year-round access. Width/depth varies by substructure design

Upland Yard

20 – 100 acre storage and staging of blades, nacelles, towers, possible fabrication of floating substructures

Crane

Minimum 40 – 600 ton lift capacity at 500 feet height to attach components

Crew Access & Maintenance

Moorage for crew access vessels. O&M berth for major repairs of full system

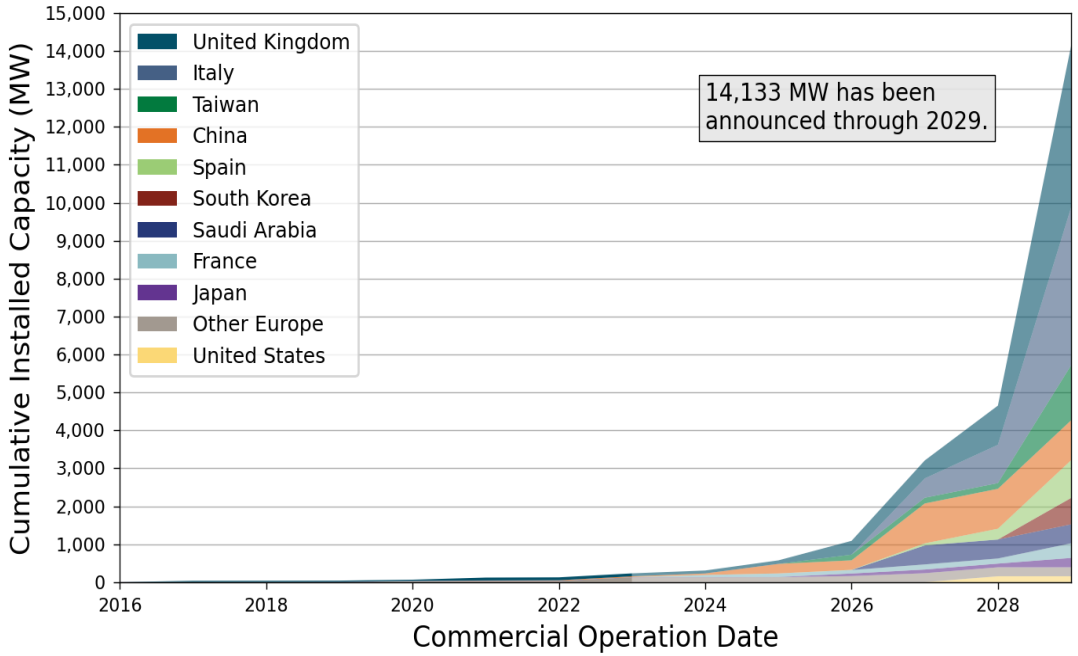
Floating Wind Commercialization is on the Horizon

2024: Pre-commercial

Small Farms (227 MW operational)

2030: Commercial Industry

Large Farms (utility scale)



NREL Support to BOEM

Project Title	Purpose
Technical Support for Offshore Wind Project Reviews and Long-term Leasing - IAA No. M22PG00040 (Ongoing)	NREL will help assess specific OSW projects and project scenarios, as well as overarching policy impacts at the state and national levels; and provide analyses and expertise to support long-term offshore wind lease planning.
U.S. OSW Design Standards – IAA No. M22PG00012 (Ongoing)	NREL is leading the development of five Recommended Practice documents (ACP OCRP Maintenance, Floating Wind, Metocean, Geotechnical,, and Submarine Cables) under a broad industry standards initiative that began in 2017.
Feasibility Study for Renewable Energy Technologies in Alaska Offshore Waters (Digital Deliverables) - IAA No. M17PG00012 (Ongoing)	In December 2023, NREL delivered a feasibility study of ocean-based renewable energy sources to help Alaska decarbonize its energy supply, increase coastal resilience, and build energy security. Digital deliverable due December 2024.
Multi-fidelity Modeling of Offshore Wind Inter-Array Wake Impacts to Inform Future U.S. Atlantic Offshore Wind Energy Area Development – IAA No. M24PG00003 (Ongoing)	Joint Industry Project (JIP) administered by National Offshore Wind Research and Development Consortium (NOWRDC) with scientists and engineers from NREL and Cornell University performing the research.
Developing Workforce Capacity for Tribal Communities to Build Floating Offshore Wind on the West Coast (New)	NREL will coordinate with Tribal Nations to assess and inform their capacity to train and provide workers that benefit from the floating offshore wind industry across California, Oregon, and Washington.
Environmental Data Sharing Strategy Workshop and Action Plan (New)	NREL (and Oceantic Network) will host a data workshop to explore potential collaborations in data sharing and the possible standardization of data collection, storage, and management; and publish an Action Plan.

What is Guam 100?

Goal: Identify affordable, technically-sound, resilient, equitable, reliable, secure strategies to achieve 100% renewable electricity by 2045

- State-of-the-art planning and modeling (focused on long term planning while assisting with immediate needs)
- Community stakeholder engagement to inform comprehensive analysis of future electricity needs, priorities (resilience, equity, and affordability), and resources to meet those needs
- Power sector focused, not decarbonization of entire energy sector or supply chains
- Process, analysis and results allow informed decision making

Thank You!

Questions?

This work was authored in part by the National Renewable Energy Laboratory, operated by Alliance for Sustainable Energy, LLC, for the U.S. Department of Energy (DOE) under Contract No. DE-AC36-08GO28308. Funding provided by U.S. Department of Energy Office of Energy Efficiency and Renewable Energy Wind Energy Technologies Office.The views expressed in the article do not necessarily represent the views of the DOE or the U.S. Government. The U.S. Government retains and the publisher, by accepting the article for publication, acknowledges that the U.S. Government retains a nonexclusive, paid-up, irrevocable, worldwide license to publish or reproduce the published form of this work, or allow others to do so, for U.S. Government purposes.

Amy Robertson
Amy.Robertson@nrel.gov

GPA Clean Energy Master Plan: Guam Renewable Goals

Guam Offshore Wind Energy Task Force meeting

11 September 2024

John J. Cruz Jr., P.E., C.E.M, MBA

Assistant General Manager, Engineering & Technical Services

Guam Power Authority

Guam Renewable Energy Goals

- Guam Public Law 35-46: Guam Renewable Portfolio Standard (RPS, 2019)
  - The Guam Power Authority shall establish a preliminary renewables portfolio standard goal of: (a) five percent (5%) of its net electricity sales by December 31, 2015; (b) fifty percent (50%) of its net electricity sales by December 31, 2035; and (c) one hundred percent (100%) of its net electricity sales by December 31, 2045.
  - The amount of renewable capacity may be subject to engineering and economic analysis by the Guam Power Authority; provided, that such changes are subsequently approved by the Public Utilities Commission.
  - P.L. 35-46 amended the original Guam RPS: P.L. 29-62 (2008)
- **Guam Power Authority Renewable Goals: FY 2022 Clean Energy Master Plan**
  - **GPA commits to 50% renewable energy production by 2030 and 100% renewable energy and non-GHG emissions energy production by 2024**

Guam Power Authority Clean Energy Transition: Much More than Putting Glass on a Roof

- GPA's Roadmap to Clean Energy includes:
  - Renewable Energy Acquisition (Technology Agnostic)
  - Energy Efficiency
  - Demand Response
  - Transportation Electrification
  - Renewable Integration
  - Grid Transformation
  - Digital Transformation
  - Cyber and Physical Security
  - Smart Grid
  - Communications Infrastructure

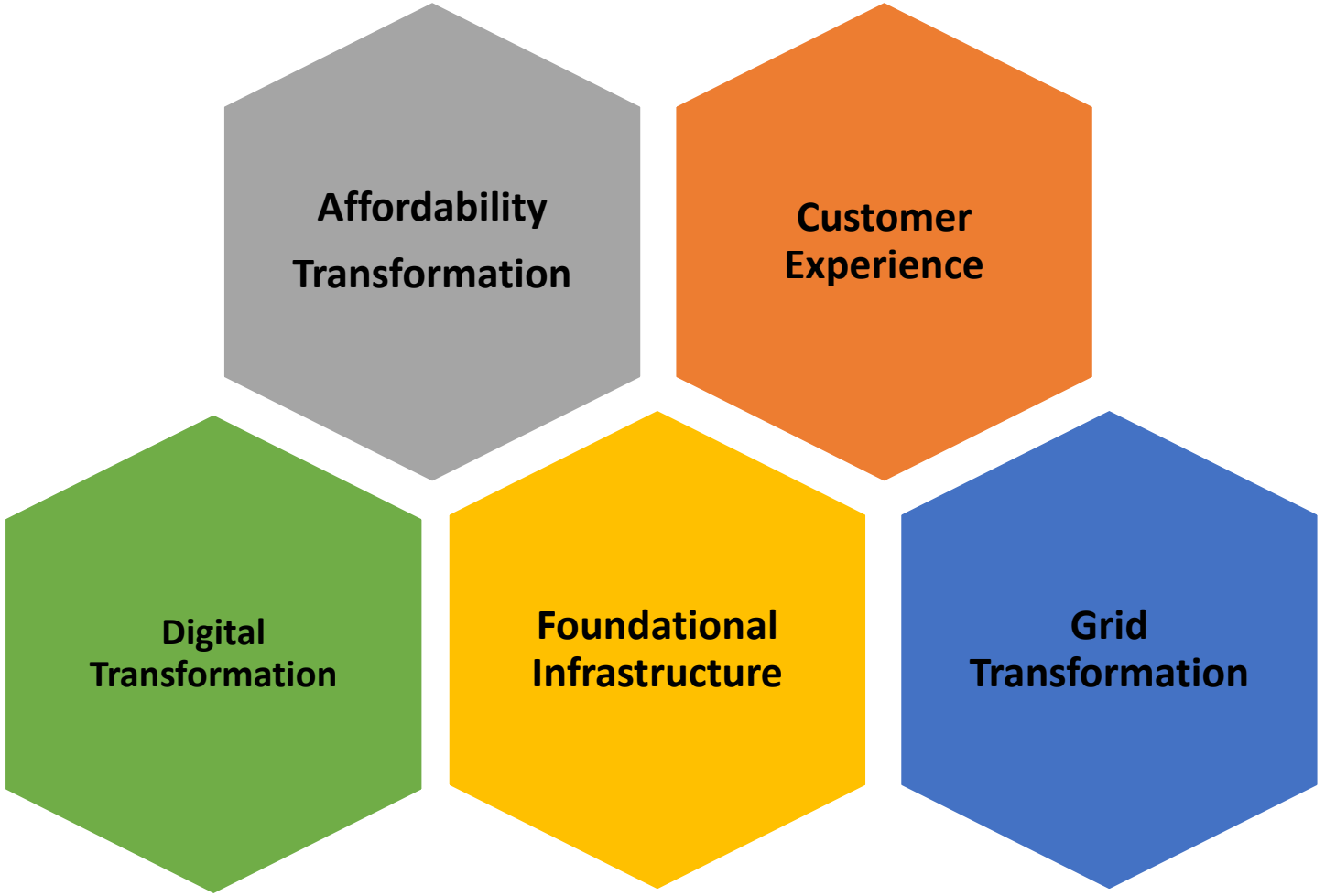
En route to Achieving 56% Energy Production Capability by 2028

Clean Energy Master Plan Contents

- Volume 1 – Generation System Reliability, Adequacy and Resiliency
- Volume 2 – Generation Expansion Plan
- Volume 3 – Addendum to the 2018 Environmental Strategic Plan
- Volume 4 – Demand Side Management Plan
- Volume 5 – Medium Range Distribution Plan
- Volume 6 – Information/Operational Technology Plan
- Volume 7 – Strategic Plan
- Volume 8 – Electric Vehicle Road Map
- Volume 9 – Net Metering Plan

Not Renewables at Any Cost. Must improve Energy Affordability, Reliability, Resiliency

Clean Energy Master Plan Focus

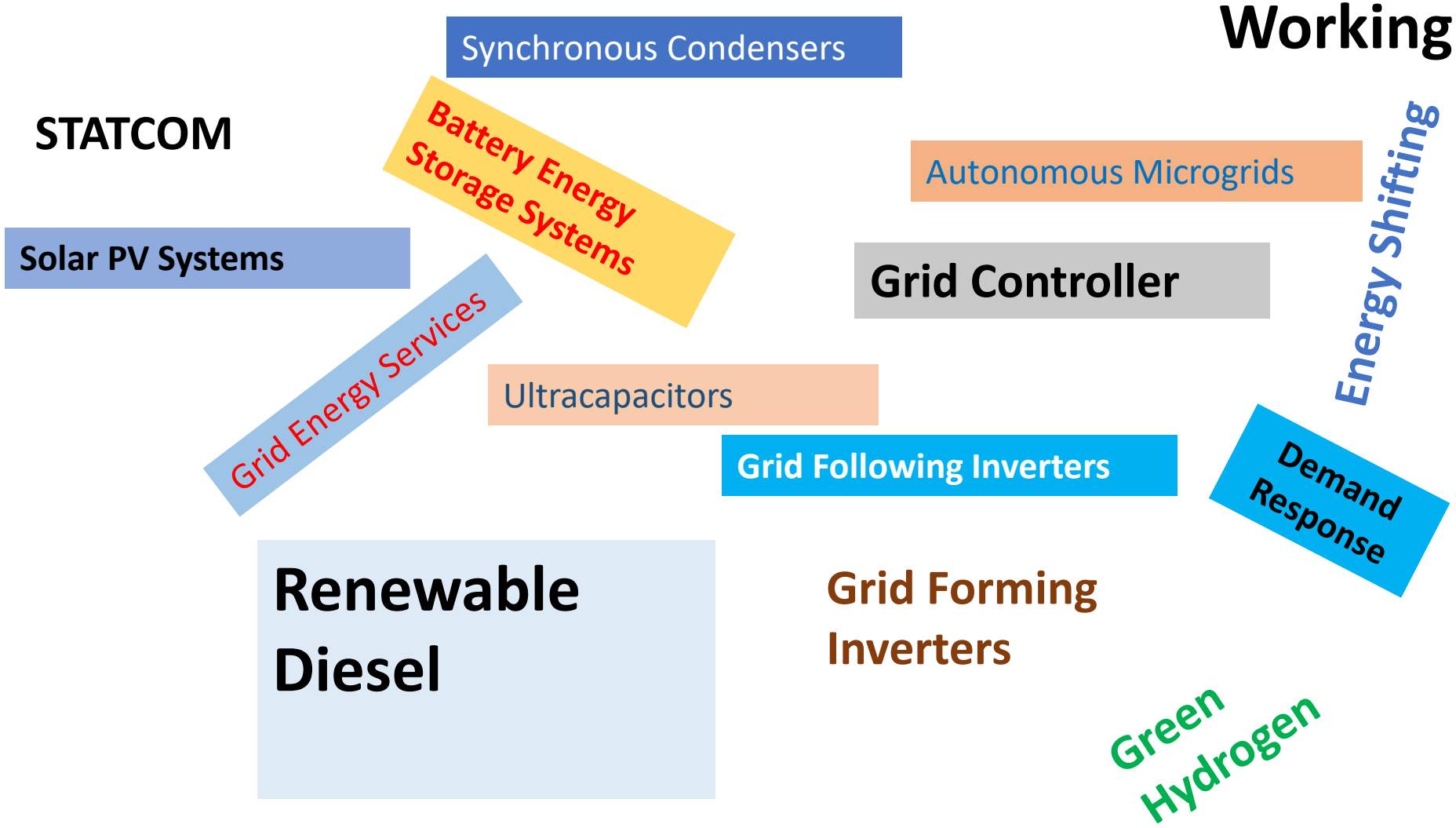


Energy Efficiency

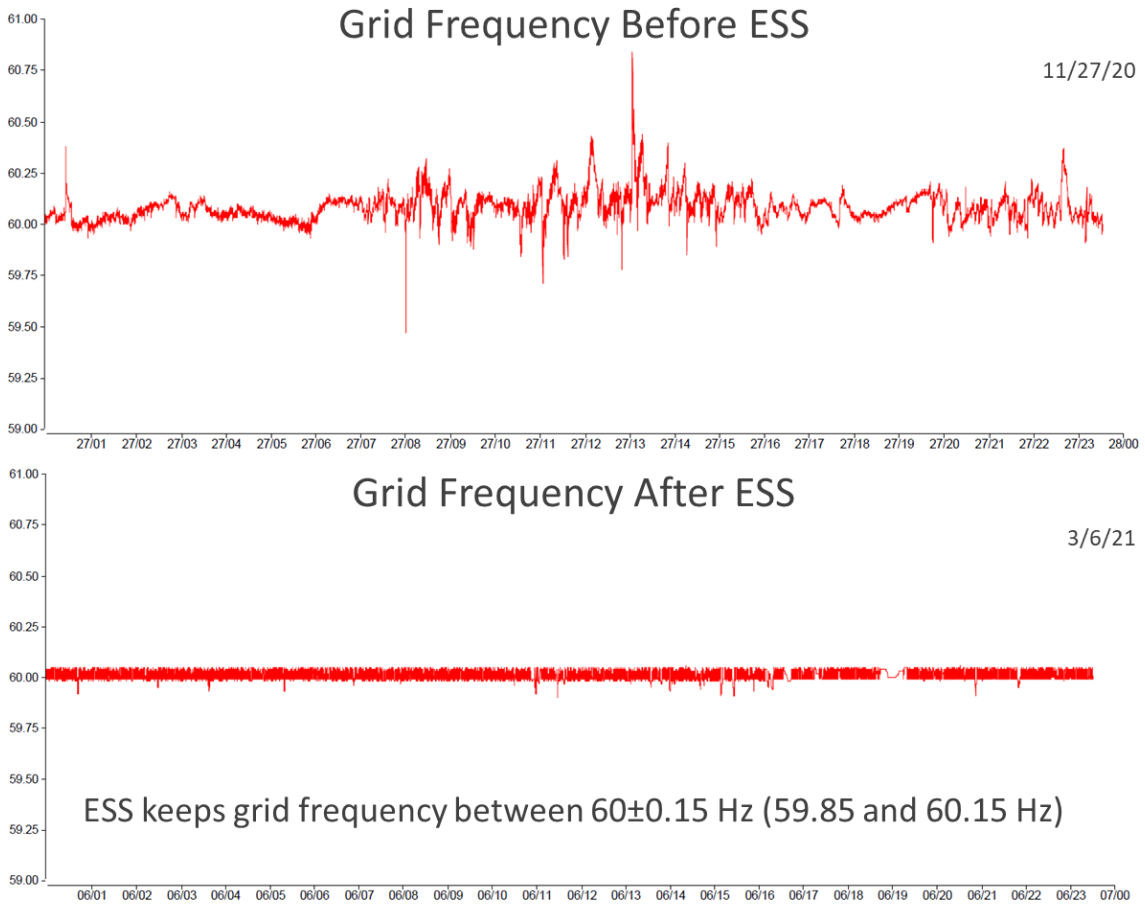
- The American Council for an Energy Efficient Economy (ACEEE) reported that energy efficiency measures can slash US energy use and greenhouse gas emissions by 50% by 2050, getting us halfway to US climate goals.
- GPA's Energy Efficient Office Building Demonstration Project developed and installed energy efficiency measures to UOG's Center for Island Sustainability on Dean Circle. GPA achieved energy consumption reductions of 50% to 75% compared with same-use identical buildings.
- GPA's Energy Sense Energy Efficient Appliance Rebate Program performance analysis study showed that from June 2020 to July 2023:
  - Program participants saved $26 MM in energy costs;
  - Achieved 10.2 MW in peak demand reduction; and,
  - Merited $27 MM in deferred capacity savings.

Renewable Integration

- No Single Silver Bullet
- Multiple Approaches **Working** Together



Hagatna BESS Frequency Regulation Performance



- GPA took a calculated risk and created a test for the PXiSE real time controller
- After a successful test, GPA has the world's fastest Frequency Response BESS
- GPA is pioneering the path forward to a carbon free grid

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BOEM BUREAU OF OCEAN ENERGY MANAGEMENT

BOEM Leasing Process and Guam Offshore Wind Planning

BOEM Guam Intergovernmental Renewable Energy Task Force Meeting #1

Deanna Meier | September 11, 2024

Presentation Topics

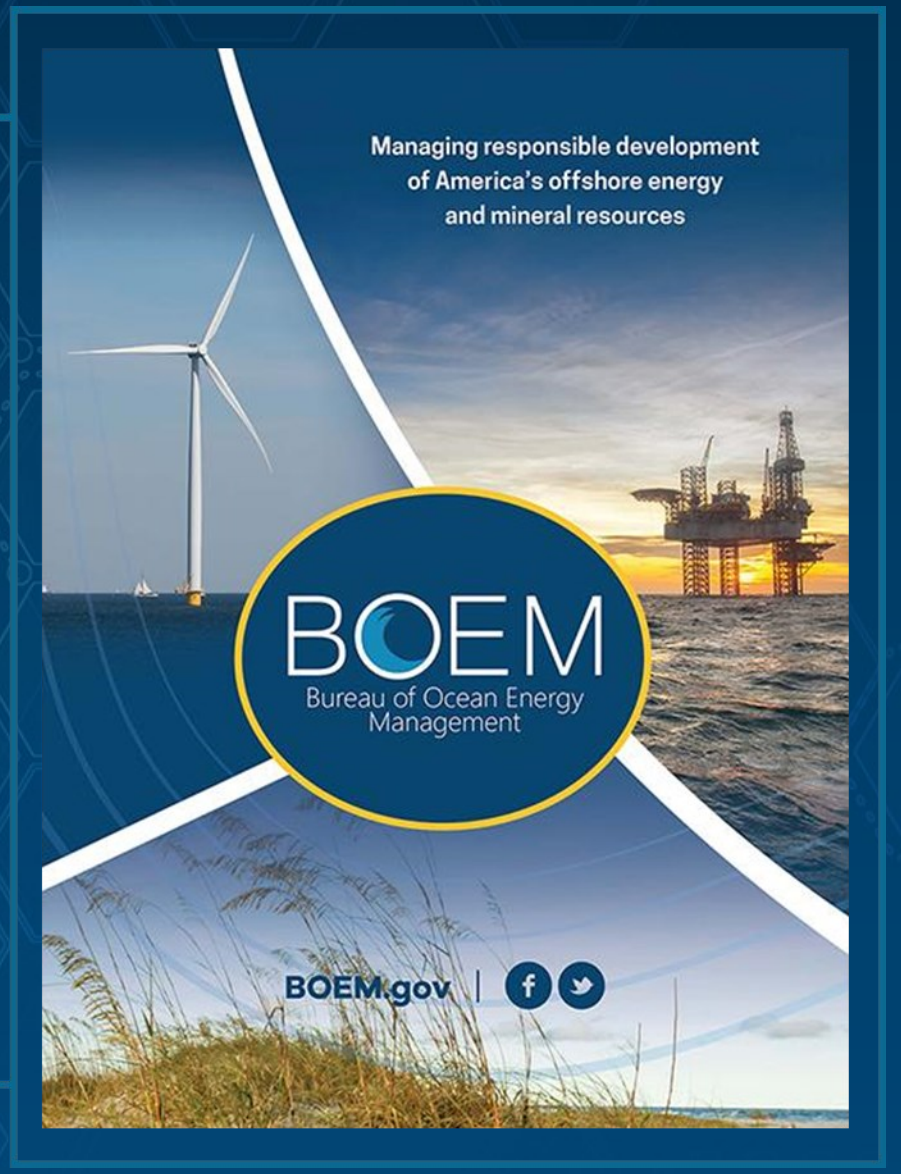
- Bureau of Ocean Energy Management (BOEM) Overview
- Planning and Leasing Approach Overview
- Technical and Ocean Use Considerations
  - Wind Speeds
  - Water Depth
  - Slope
  - Vessel Traffic Routes
  - Fisheries and Other Considerations
  - DoD Mission Compatibility
- Next Steps

BOEM Mission

To manage the development of U.S. Outer Continental Shelf (OCS) energy, mineral, and geological resources in an environmentally and economically responsible way.

BOEM manages almost 3.2 billion acres of the U.S. Outer Continental Shelf

BOEM is one of the 11 Bureaus of the U.S. Department of the Interior (DOI)



Key Legislation

OCS Lands Act: "… vital national resource … expeditious and orderly development … environmental safeguards"

Energy Policy Act of 2005: "… energy from sources other than oil and gas …"

The Inflation Reduction Act (IRA) "provides DOI with the authority to issue leases, easements and rights-of-way offshore US territories…"

Alaska OCS

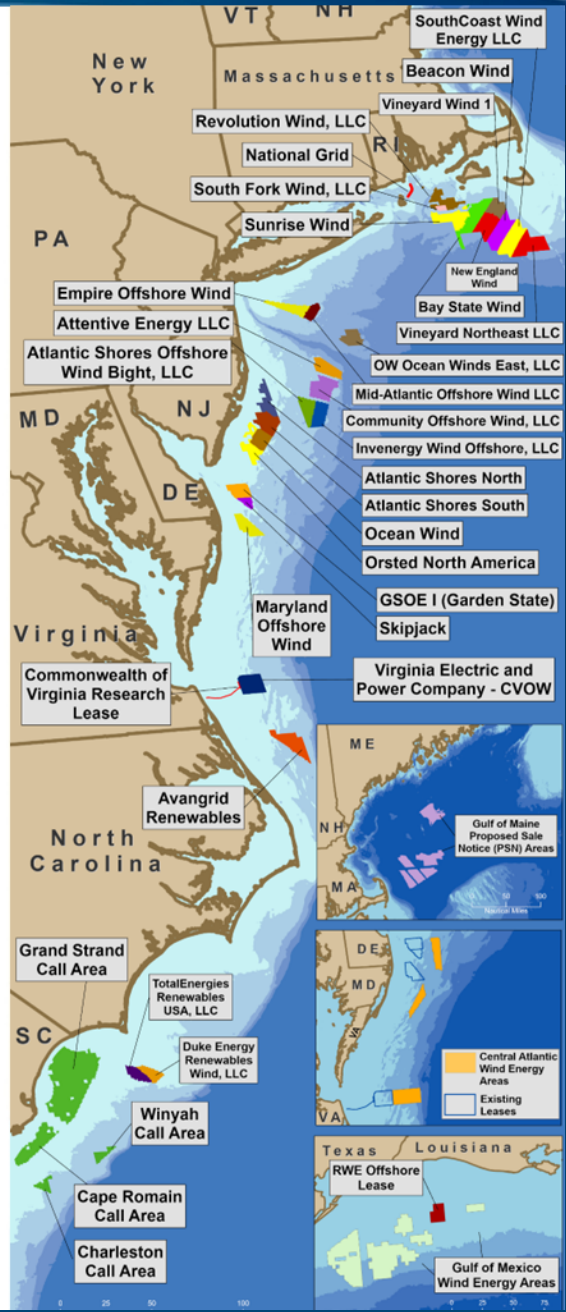
Pacific OCS

Gulf of Mexico OCS

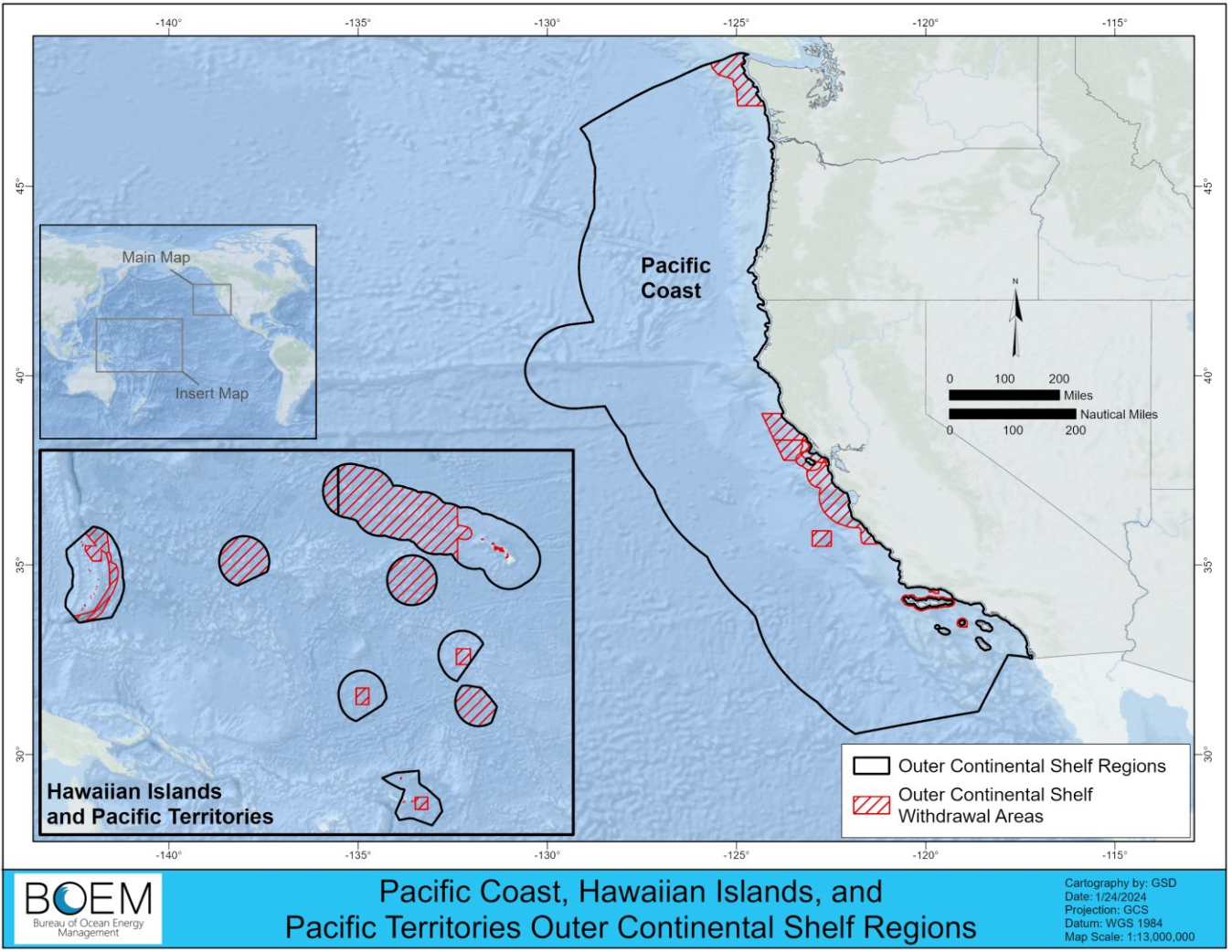
Atlantic OCS

Renewable Energy Program by the Numbers

Competitive Lease Sales Completed:	13
Commercial Offshore Leases Issued:	35
Research Offshore Leases Issued:	2
Site Assessment Plans (SAPs) Approved:	17
General Activities Plans Approved:	1
Construction and Operations Plans (COPs):	
• Submitted to BOEM	19
• Records of Decision Issued	9
• Under Review	6
• Other COPs Submitted	4
Leasing Under Consideration:	4



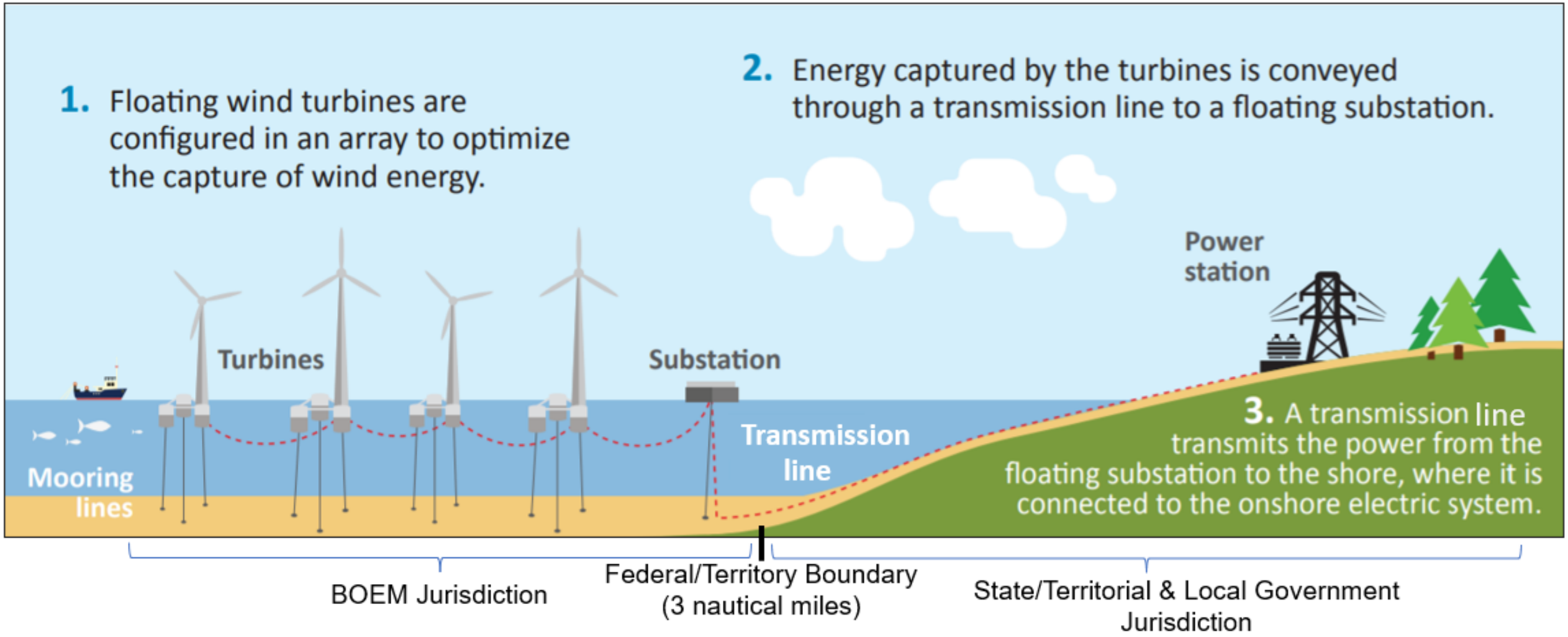
Background: BOEM Pacific Region Jurisdiction



Jurisdiction in the Pacific Region:

- OCS typically extends from 3 to 200 nautical miles off the coast of California, Oregon, Washington, Hawaii, and the Pacific Territories
- Excludes National Marine Sanctuaries, National Monuments, National Wildlife Refuges, and National Parks

Floating Offshore Wind Energy Project Basics



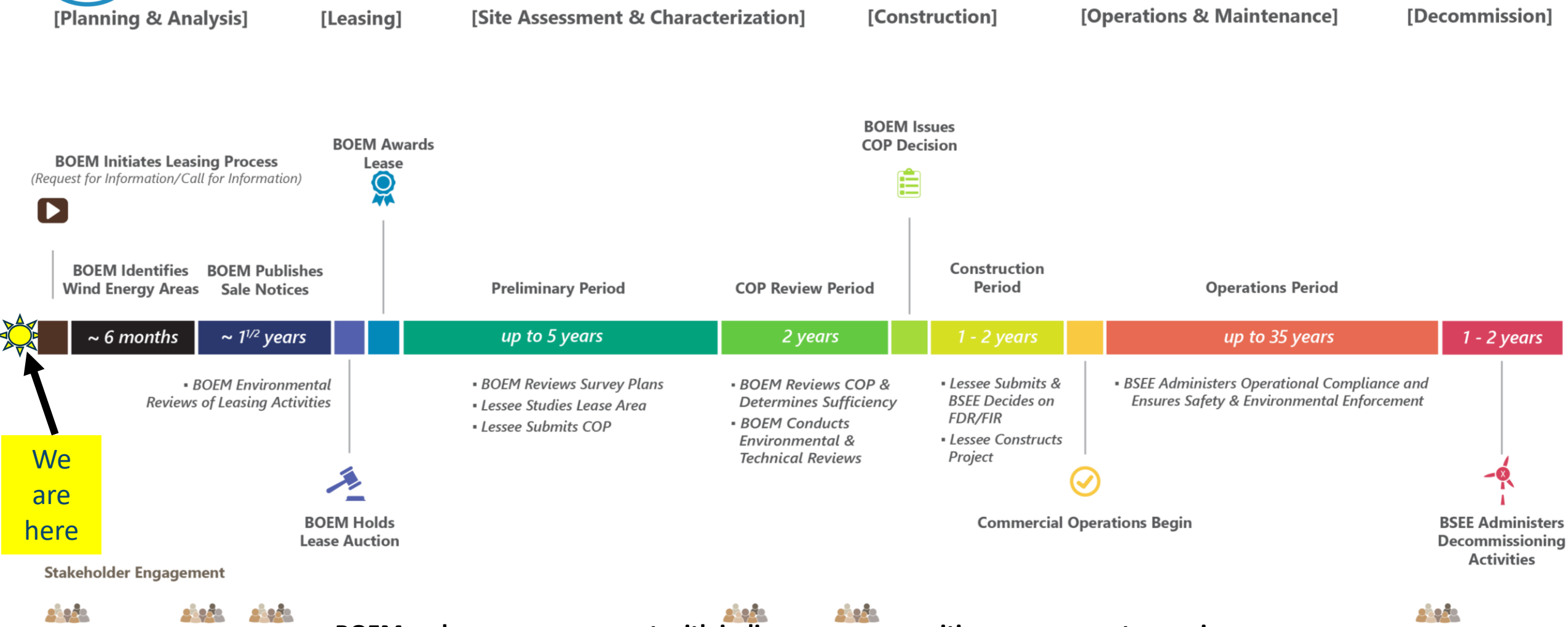
Opportunities with Offshore Wind

- **High Energy Potential:**
  - More efficient than onshore wind farms because of higher and more consistent wind
- **Proximity to Coastal Population Centers:**
  - Could produce large volumes of energy near coastal loads
- **Diversification of Renewable Energy Sources:**
  - Diversifies electricity supplies and may be complementary to solar generation
- **Economic Development:**
  - Offshore wind industry can create jobs, improve infrastructure, and stimulate local economies
- **Energy Independence:**
  - A tool to help increase local energy production and reduce dependency on imported energy

Floating Offshore Wind

- Can help us reach areas once thought unattainable
- Can drive U.S. leadership in floating offshore wind design, development, and manufacturing
- **BOEM** is pursuing the Administration's goal to deploy 15 GW of floating offshore wind by 2035 – *enough to power more than 5 million American homes!*
- Collaboration and development efforts are underway in the Pacific Region (California, Oregon, Hawaii) and the Gulf of Maine

The Renewable Energy Leasing Process



BOEM welcomes engagement with indigenous communities, government agencies, and stakeholders throughout the process.

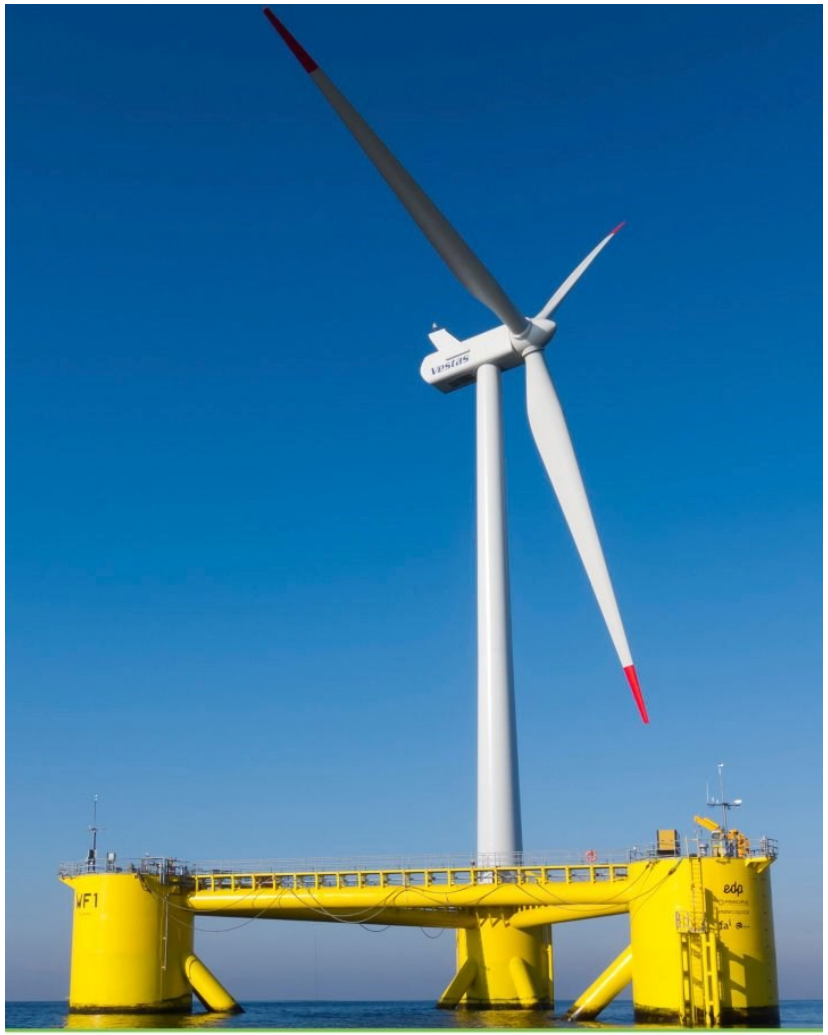
BOEM's Process: Many Opportunities for Deconfliction, Reductions in Impacts, and Public Comments

BOEM's multistep process to deconfliction and potential project development includes the following *formal* opportunities (public comment periods) for input to inform avoidance, minimization, and mitigation of impacts to environmental and cultural resources, as well as other uses of the marine environment and seabed:

- **Prior to leasing:**
  - Call for Information and Nominations
  - Draft Wind Energy Areas
  - Proposed Sale Notice and Environmental Assessment for leasing
- **After leasing:**
  - Project-level Environmental Impact Statement

Renewable Energy Process: Planning & Analysis

- Call for Information and Nominations (Call)
  - Calls for formal public comment about the area, uses, and concerns
  - Requests nominations of interest for development
- Wind Energy Area (WEA)
  - An area within a Call Area identified by BOEM for further evaluation, including environmental review
  - Basis for a Lease Area(s)
- Lease Area
  - Areas BOEM would offer for lease during a Lease Sale

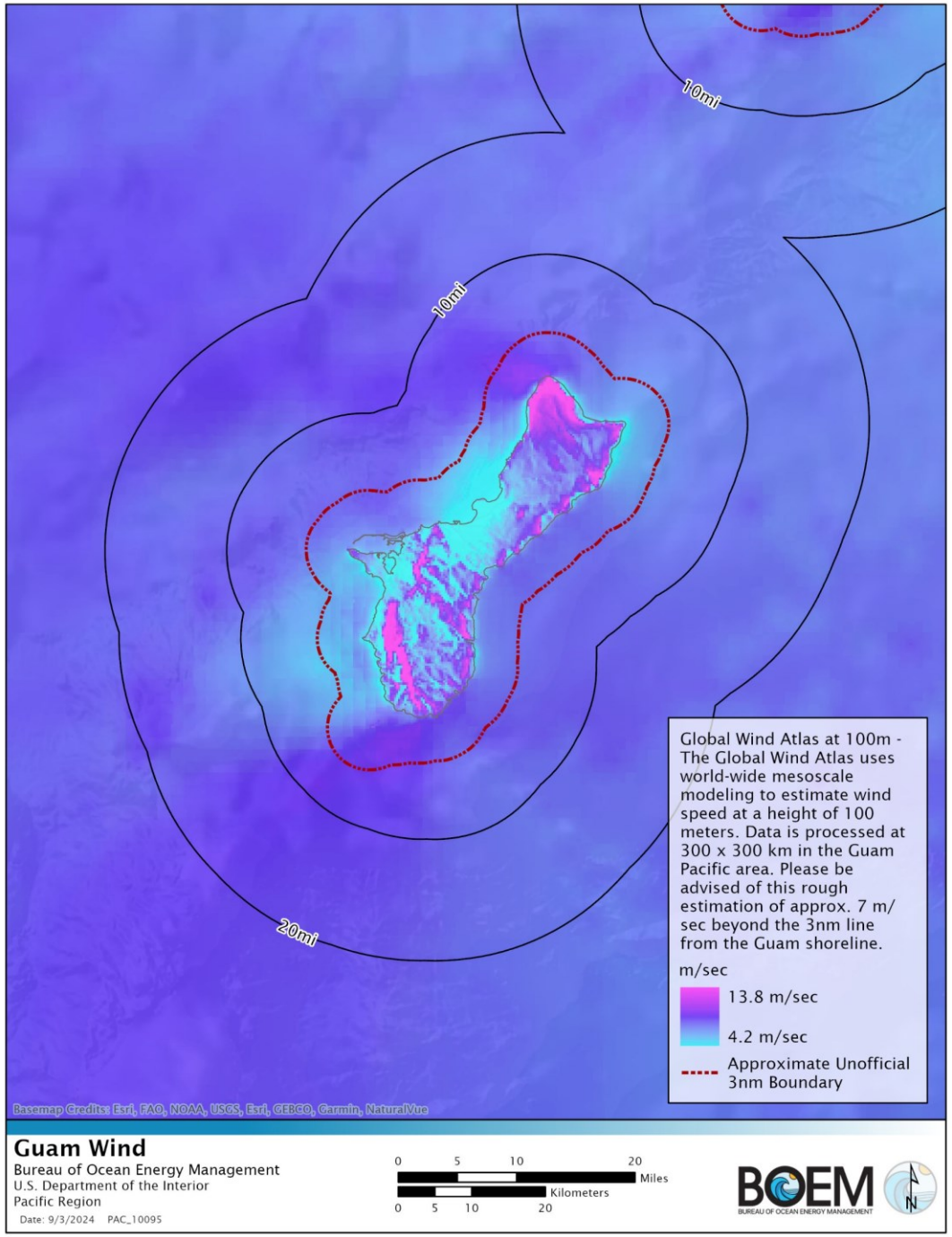


Aguçadoura WindFloat Prototype
October 2011 - 4KM Offshore of Aguçadoura, Portugal
PRINCIPLE renewable energy delivered

Offshore Wind Suitability: Technical Considerations

Wind Speeds

- Average ≥ 7 meters/second (13.6 knots)

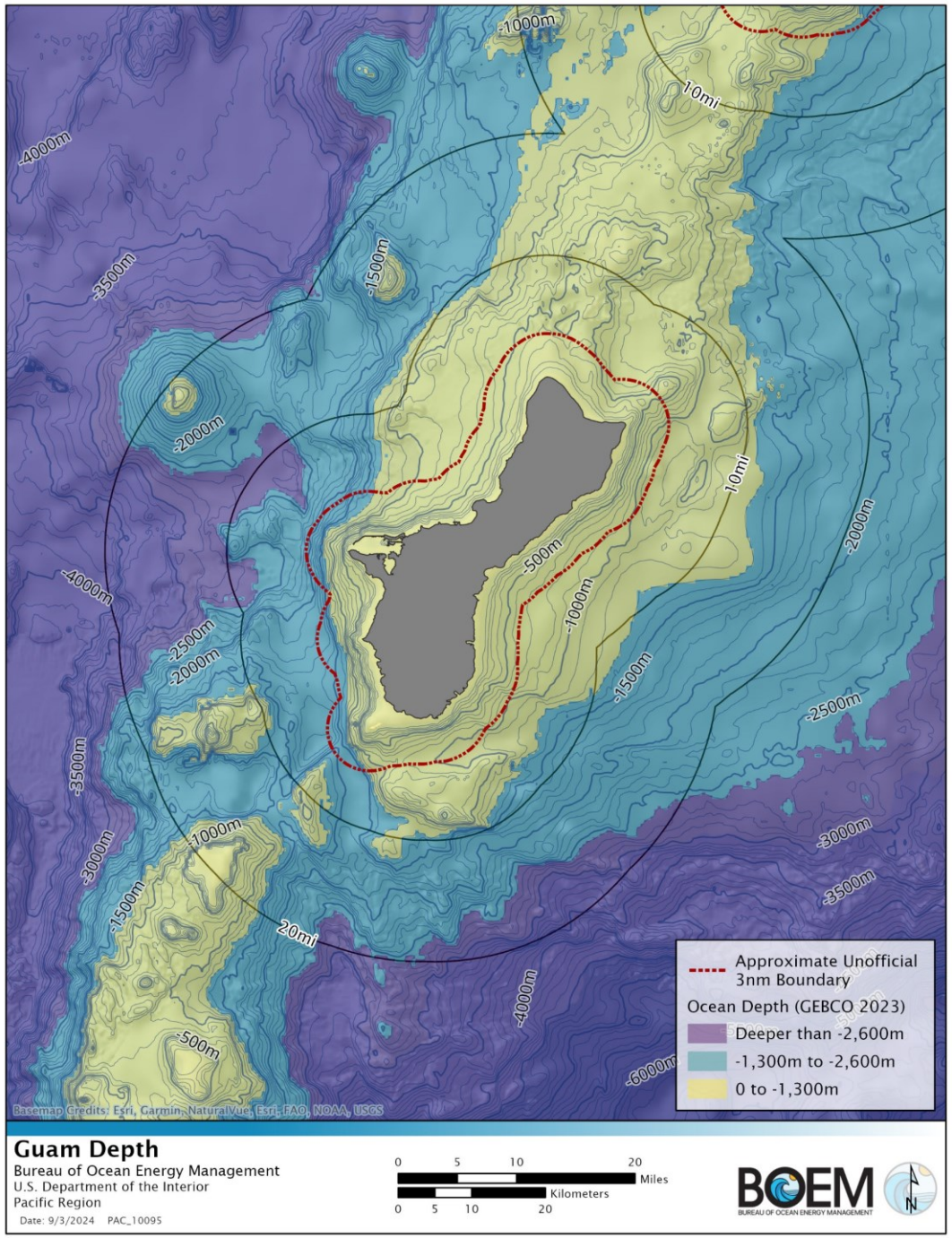


Offshore Wind Suitability: Technical Considerations

Water Depths

- Up to 1,300 meters deep (for near-term commercialization); up to 2,600 m (for longer term planning)

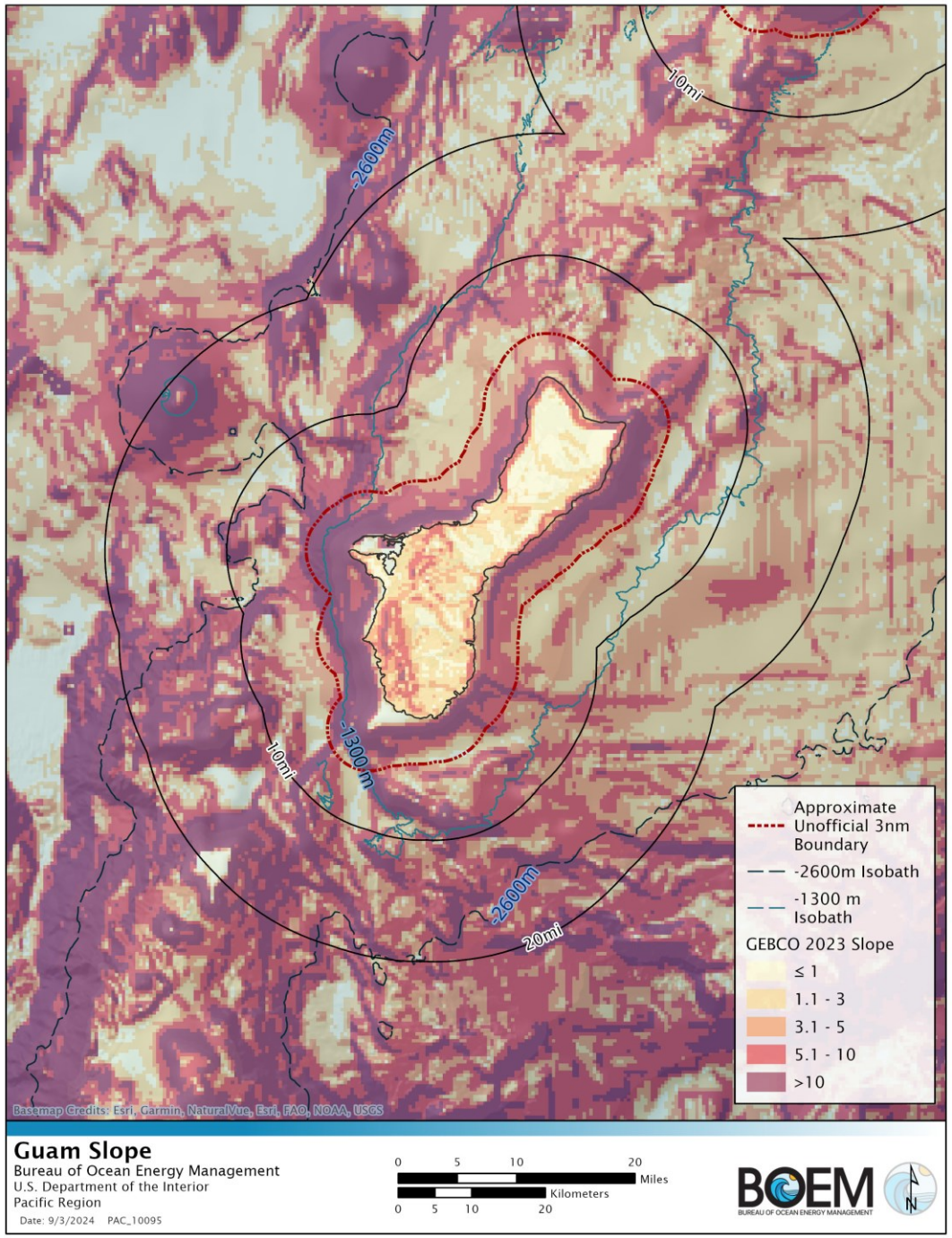
- World's deepest floating offshore wind facilities currently at 300 meters depth



Offshore Wind Suitability: Technical Considerations

Slope

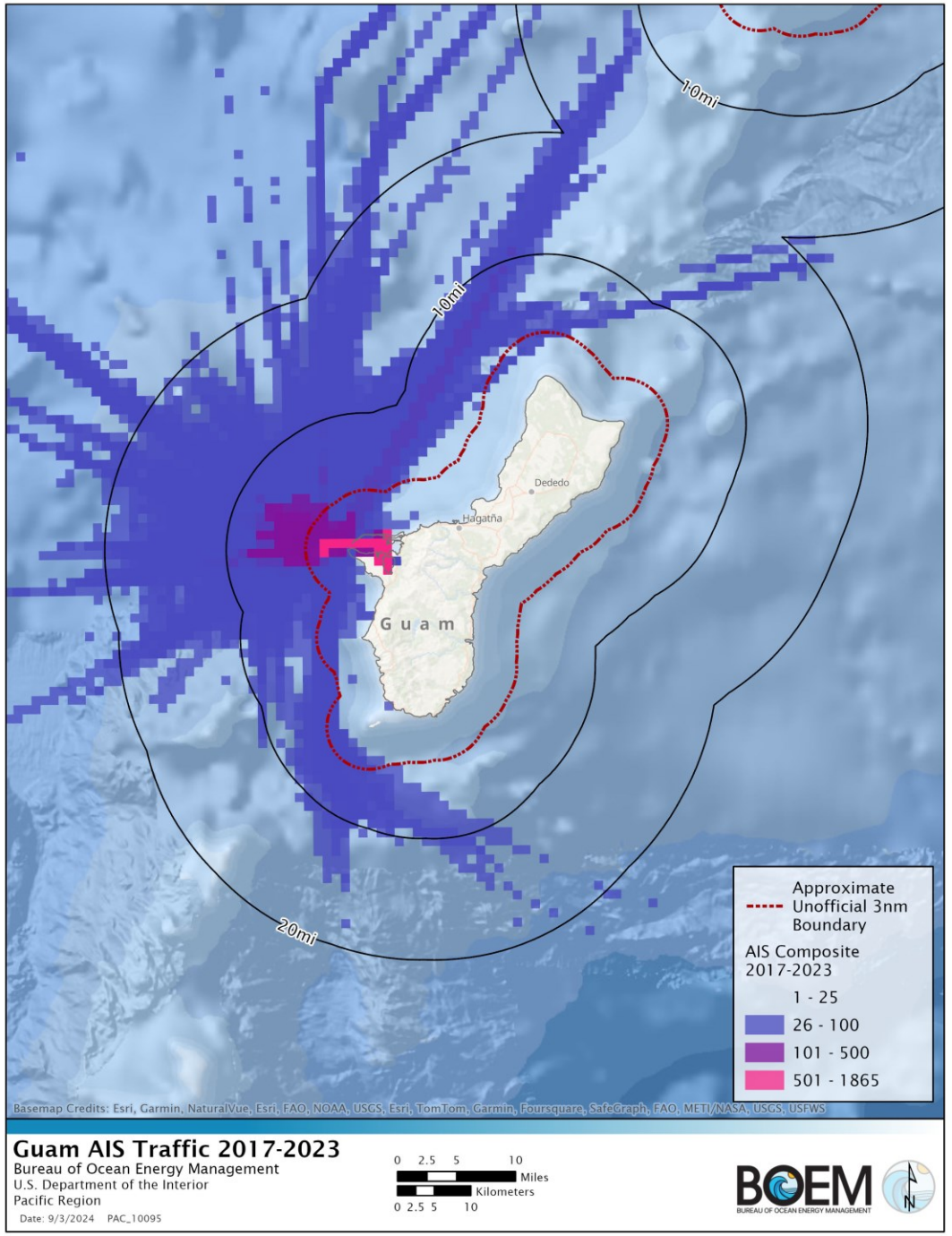
- Slope of the seafloor <10 degrees



Offshore Wind Suitability: Vessel Activity

Vessel Traffic

- AIS data showing vessel traffic



Additional Considerations

Fishing Activities

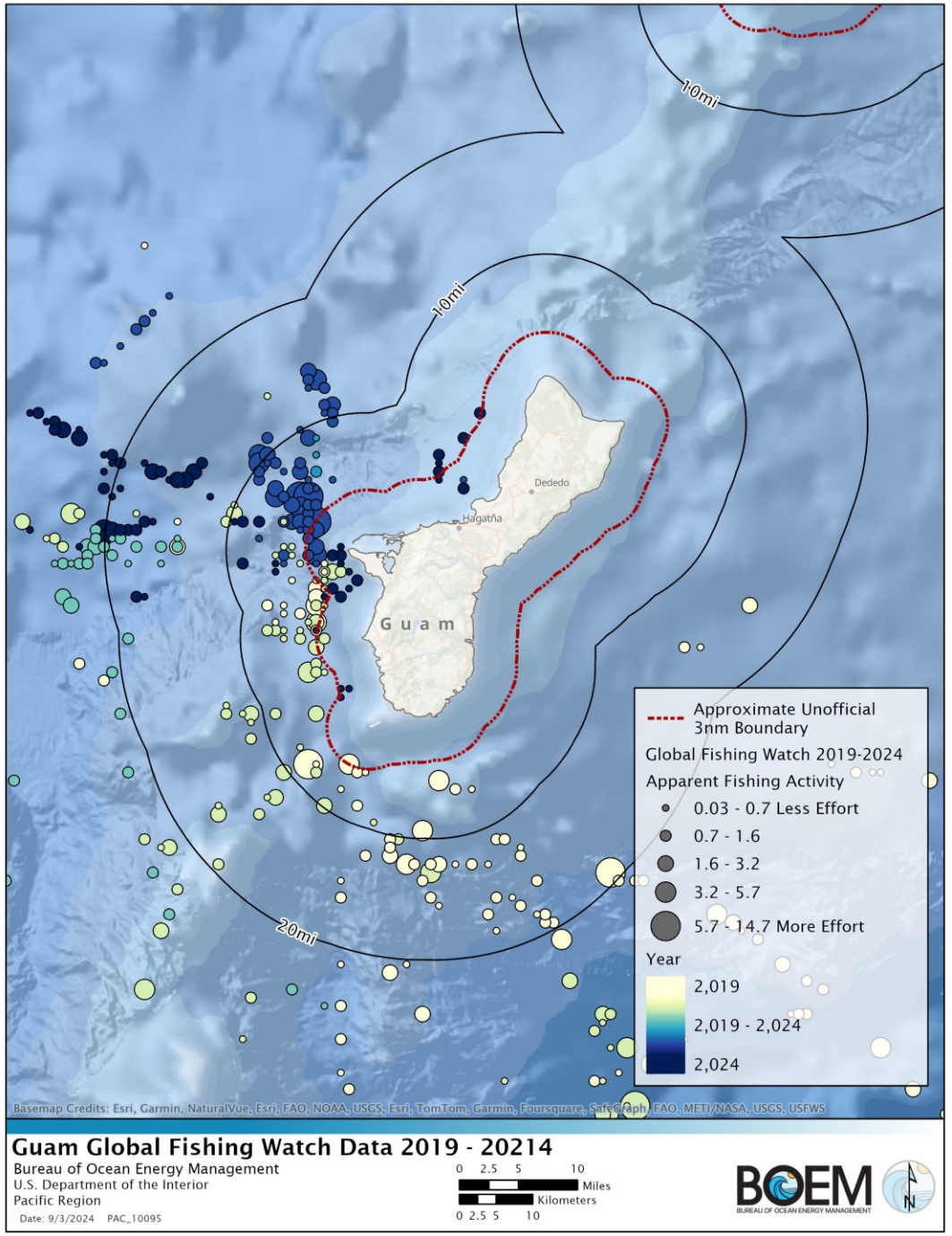
- Fishing data is sparse around Guam
- Efforts to obtain more data

Department of Defense Mission Compatibility

Distance from Shore

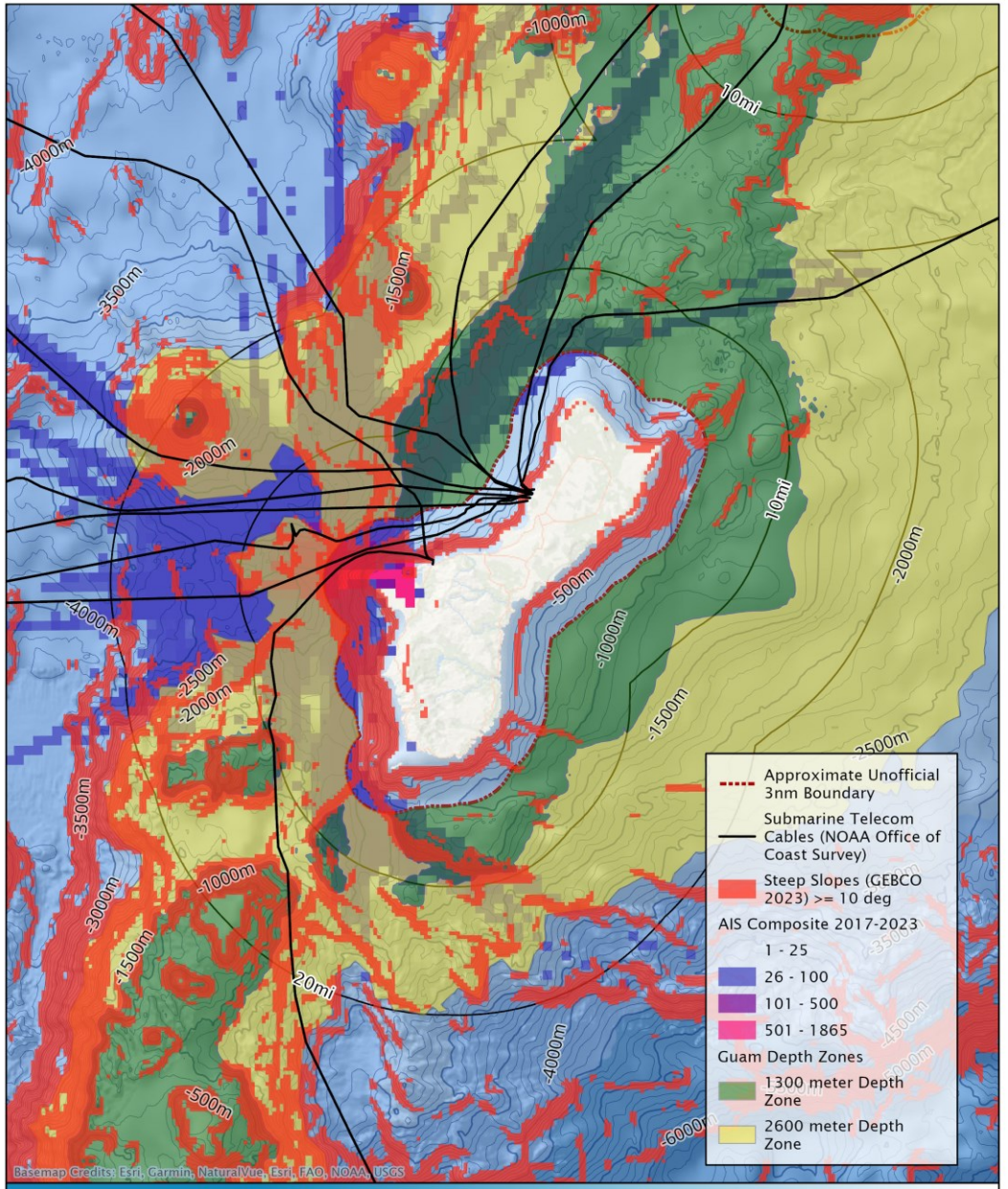
Nearshore Marine Reserves

Biological and Cultural Resources



Areas for Consideration

- Areas that could be feasible for future offshore wind leasing based on slope, depth, distance from shore, vessel traffic, and telecom cable locations



OSW Status in Guam and Next Steps

- The Guam Governor's Office is interested in possible OSW leasing to help meet Guam's Renewable Energy Goals
- BOEM is starting to engage in offshore wind planning around Guam
- Potentially develop Call Area(s)
  - Federal Register notice to request formal public comment about the area, uses, and concerns and nominations of interest for development
- Data gathering and Suitability analysis for siting Wind Energy Areas (WEA), which is a joint effort between BOEM and NOAA's National Center for Coastal Ocean Science (NCCOS)
- BOEM is delineating the official Submerged Lands Act boundary for Guam, CNMI, and American Samoa (prioritizing Guam boundaries and protraction naming)
- BOEM is conducting various studies to inform potential future decisions
- Stay engaged in Guam offshore wind activities: www.boem.gov/Guam

Potential Discussion Topics

- Clarification on BOEM's process
- Input and discussion on particular OCS areas offshore Guam
- Best practices for outreach and engagement to solicit community input
- Suggestions for data sources (biological, cultural or physical resources) for future suitability analysis

BOEM

BUREAU OF OCEAN ENERGY MANAGEMENT

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BOEM Guam Task Force Coordinator | Deanna Meier | deanna.meier@boem.gov | 805-384-6265

www.boem.gov/Guam

Discussion on BOEM and Guam Presentations

Instructions – Task Force Members

- Mute yourself when not speaking.
- To enter the discussion queue:
  - **Place your name card on its side.** Please lower your card once you are done speaking.
  - **Use the "Raise your hand" button or press *9 on your phone.** Please lower your hand once you are done speaking.
    - If unable to speak, use the chat for technical assistance. Refrain from sidebar conversations.
- Task Force members are encouraged to keep their webcam on during introductions and discussions.

Lunch Break

Please Return at 1:00 p.m. ChST

BOEM BUREAU OF OCEAN ENERGY MANAGEMENT

Overview of BOEM-Funded Environmental Research to Inform Renewable Energy Offshore Guam

BOEM Guam Intergovernmental Renewable Energy Task Force Meeting

David Pereksta | September 11, 2024

BOEM & Environmental Studies

BOEM's Mission:

Manage development of U.S. Outer Continental Shelf (OCS) energy, mineral, and geological resources in an environmentally and economically responsible way.

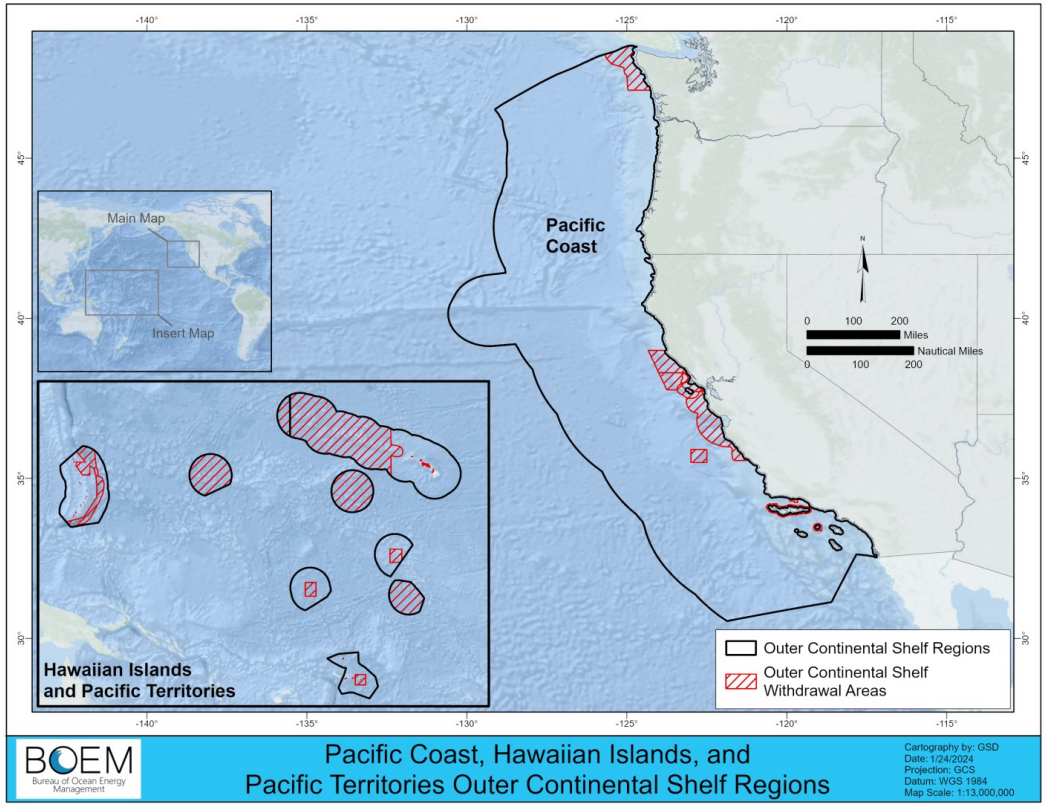
BOEM's Environmental Studies Program:

Conduct studies that will provide the information needed to predict, assess and manage impacts on the human, marine, and coastal environments from offshore energy and marine mineral development.

Research conducted by federal agencies, universities, consultants, and non-profits through interagency agreements, cooperative agreements, and contracts.

Pacific OCS Environmental Studies:

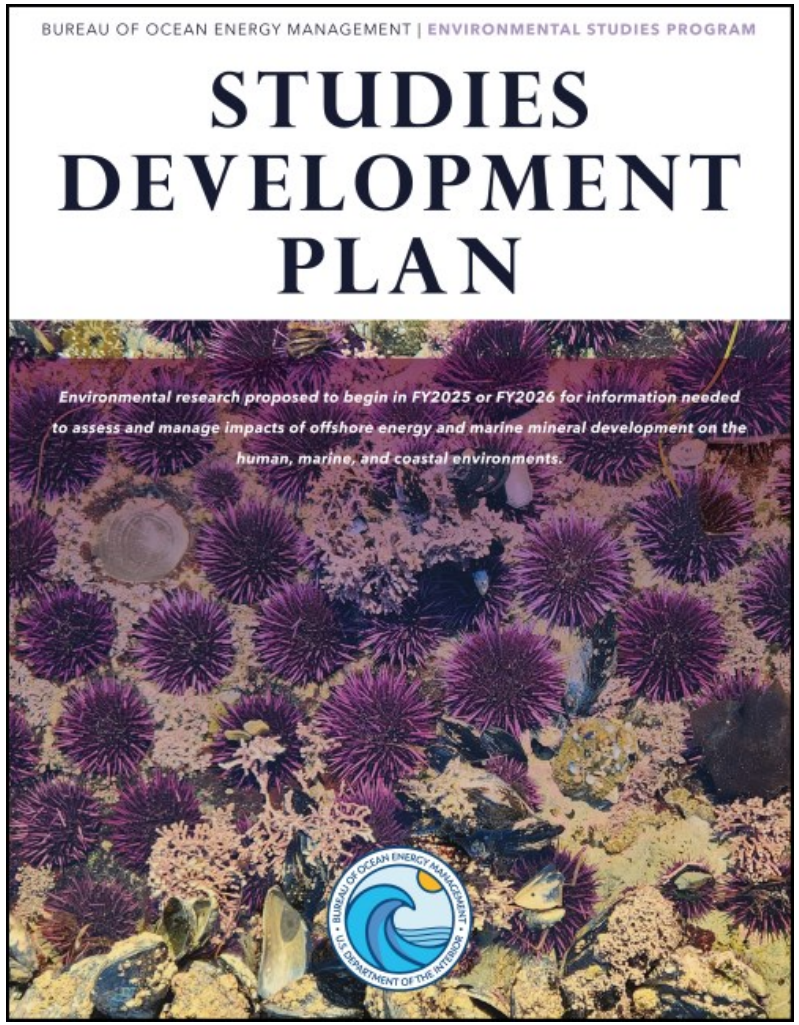
Since 1973: >330 studies conducted (>$150 Million)



BOEM Studies Development Planning

- Annual Studies Development Plan
- Two-year planning period
- Annual request for study ideas
- Brief descriptions of proposed studies in that two-year period

BOEM's Environmental Studies Website



BOEM-Funded Environmental Studies Offshore Guam

- **3 Studies specific to Guam** (1 ongoing and 2 planned)
- 2023 to present
- BOEM funding:

Status	# Studies	Funding
Ongoing	1	$1.2 M
Planned	2	$1.1 M
Total	3	$2.3 M

- Study types:
  - 2 Cultural / Marine Archaeological Resources studies
  - 1 Marine Habitat Characterization study

BOEM-Funded Environmental Studies Offshore Guam

Status	Duration	Study Title	Researcher	Marine Habitat Characterization	Cultural / Marine Archaeology
Ongoing	2023-2027	Maritime Heritage of the U.S. Pacific Islands	East Carolina University		✓
Planned	2024-2026	Battle of the Pacific: Guam – A Multi-Partner Collaboration on Underwater Cultural Heritage, Mapping, and Engagement*	Scripps Institution of Oceanography		✓
Planned	2024-2028	Interagency Deepwater Habitat Characterization Efforts in the Western Pacific*	National Oceanic and Atmospheric Administration	✓	

* Planned studies are dependent on funding in future fiscal years that has not yet been budgeted

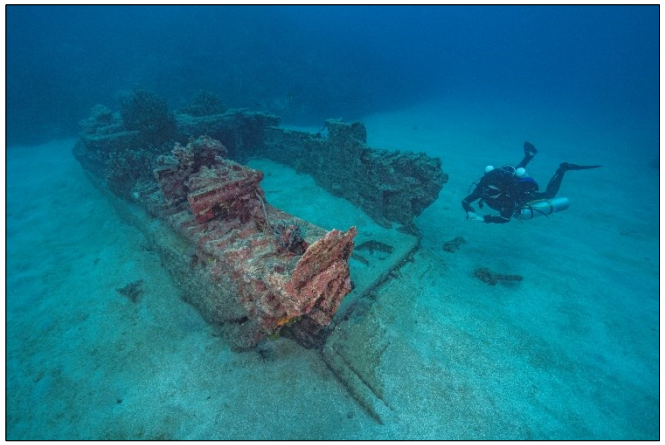
Maritime Heritage of the U.S. Pacific Islands

- 2023-2027 partnership between BOEM and East Carolina University, Program in Maritime Studies.
  - Local research partners are currently being identified.
  - Initial meetings and site visits in Guam and Saipan were conducted in August 2024.
- Objectives:
  - Develop a database of underwater cultural heritage sites offshore the U.S. Pacific Island Territories.
  - Identify best practices for working with Indigenous communities.
- Results will inform planning and environmental reviews for possible leasing of renewable energy and marine minerals in federal waters surrounding the islands.
- Work in Guam and the Northern Mariana Islands began in 2023. Work in American Samoa may start in late 2024.
- Details: Environmental Studies Program – Ongoing Study

A community meeting in Saipan, held in support of the Maritime Heritage study.

Battle of the Pacific: Guam – A Multi-Partner Collaboration on Underwater Cultural Heritage, Mapping, and Engagement

- Planned 2024–2026 partnership with:
  - Scripps (for marine archaeology survey)
  - Potential local partners (for community engagement on maritime heritage) include Guam Sea Grant and University of Guam
- Objectives:
  - Analyze archival data of submerged archaeological resources offshore Guam, building on the *Maritime Heritage of the U.S. Pacific Islands* study.
  - Conduct marine remote sensing survey of submerged battlefield landscapes.
  - Evaluate National Register eligibility of a battlefield cultural landscape offshore Guam.
  - Engage with local communities to enhance public outreach on submerged cultural heritage.
- Results will be used in delineating World War II battlefield landscapes, conducting individual site assessments, conducting National Historic Preservation Act Section 106 consultations, and National Environmental Policy Act analyses.

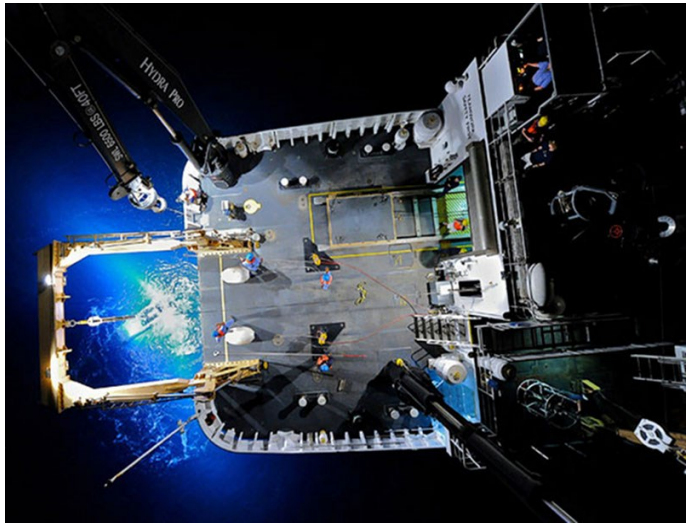


An amphibious tractor, one of the few currently known underwater relics from the 1944 invasion of Guam. Image courtesy of National Park Service via Guam: A Biogeographic and Maritime Cultural Landscape Exploration of a WWII Amphibious Battlefield. Source

Interagency Deepwater Habitat Characterization Efforts Offshore Guam

- NOAA and partners are planning multiple deepwater science cruises in the Central and Western Pacific over the next several years. BOEM plans to contribute funds to expand anticipated 2025 work in the vicinity of Guam.
- Objective: Collect information about biological communities and physical conditions in water column and benthic habitats in remote areas of the Western Pacific.
- Multiple science cruises offshore Guam are likely, including:
  - Spring 2025: Exploration Vessel *Nautilus* cruise
    Cruise will support geology, benthic biology and water column objectives.
  - Summer 2025: NOAA Ship *Okeanos Explorer* cruise
    Cruise will complement BOEM's *Battle of the Pacific: Guam* marine archaeology study.
  - Fall 2025: NOAA Ship *Okeanos Explorer* cruise
    Cruise will support geology, benthic biology and water column objectives

Image courtesy of NOAA Office of Ocean Exploration, 2016 Deepwater Exploration of the Marianas



A unique down-looking view of a ROV recovery at night. *Image courtesy of NOAA Office of Ocean Exploration*

Ecological Information for Renewable Energy

- Seasonal distribution, abundance, density
- Migration routes and patterns
- Attraction and avoidance behavior
- Displacement effects
- Prey base changes
- Nocturnal activity and movement
- Effects of noise, vibration, lights and structures
- Collision risk

Difficult information to collect due to weather, vessel availability, etc.

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Multi-tiered Approach and Goals

Broad-scale Assessments

- Facilitate planning at landscape level
- Government supported

Site-specific Assessments

- Project-level planning and assessment
- Project proponent supported
- BOEM guidelines based on statistical analysis

Goals

- Identify baseline conditions
- Detect changes associated with anthropogenic effects
- Design and implement projects that will minimize adverse effects to marine resources to the maximum extent possible

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Strategic Approach to Renewable Energy Research

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Synthesize Existing Data

- Identify existing information and data gaps
- Predictive modeling

Collect New Data

- At sea surveys and colony catalogs
- Telemetry studies
- Technology advancement

Assess Risk

- Impacting factors
- Assess interactions, risk, vulnerability

Monitor and Mitigate

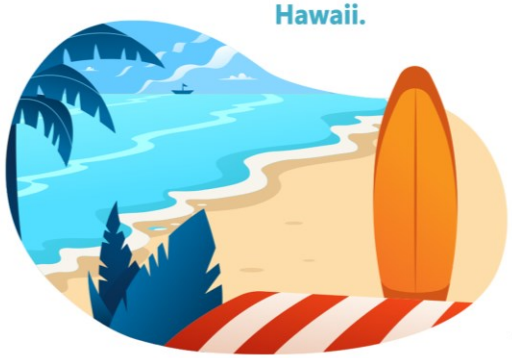
- Track change over time resulting from project construction and operation and compensate for impacts

Pacific Region Environmental & Technical Studies

Bureau of Ocean Energy Management

Pacific Programs

BOEM's Pacific Region Office manages the responsible development of offshore energy and mineral resources in federal waters off the coasts of California, Oregon, Washington, and Hawaii.



Science for Informed Decisions
boem.gov

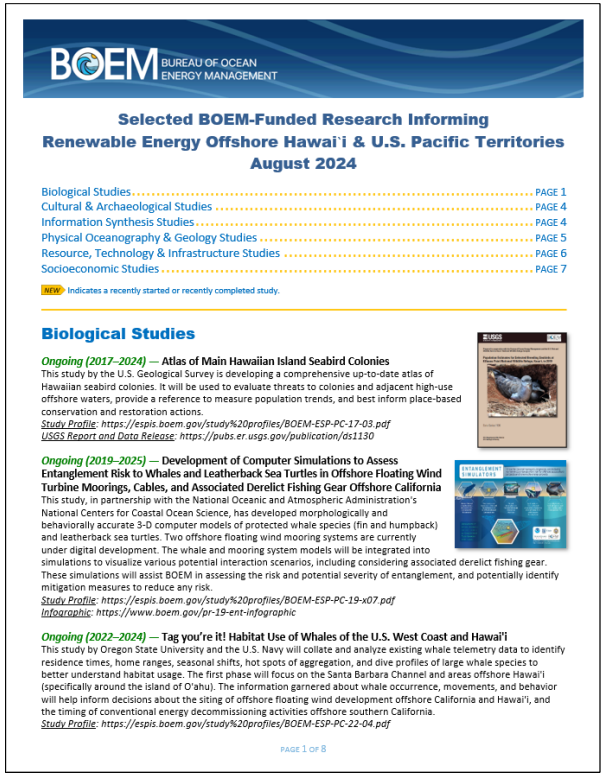
To carry out its mission, the Pacific Region employs a diverse workforce of geoscientists, petroleum engineers, renewable energy specialists, physical scientists, biologists, environmental protection specialists, environmental scientists, and policy and administrative analysts.

Access current and recently completed studies, annual studies plans, and links to handouts on BOEM-funded research and the Pacific Region's recorded speaker series, the West Coast Renewable Energy Science Exchange.

Pacific Region

Environmental Studies

BOEM Bureau of Ocean Energy Management



BOEM BUREAU OF OCEAN ENERGY MANAGEMENT

Selected BOEM-Funded Research Informing Renewable Energy Offshore Hawai`i & U.S. Pacific Territories August 2024

NEW Indicates a recently started or recently completed study.

Biological Studies

Ongoing (2017–2024) — **Atlas of Main Hawaiian Island Seabird Colonies**
This study by the U.S. Geological Survey is developing a comprehensive up-to-date atlas of Hawaiian seabird colonies. It will be used to evaluate threats to colonies and adjacent high-use offshore waters, provide a reference to measure population trends, and best inform place-based conservation and restoration actions.
Study Profile: https://espis.boem.gov/study%20profiles/BOEM-ESP-PC-17-03.pdf
USGS Report and Data Release: https://pubs.er.usgs.gov/publication/ds1130

Ongoing (2019–2025) — **Development of Computer Simulations to Assess Entanglement Risk to Whales and Leatherback Sea Turtles in Offshore Floating Wind Turbine Moorings, Cables, and Associated Derelict Fishing Gear Offshore California**
This study, in partnership with the National Oceanic and Atmospheric Administration's National Centers for Coastal Ocean Science, has developed morphologically and behaviorally accurate 3-D computer models of protected whale species (fin and humpback) and leatherback sea turtles. Two offshore floating wind mooring systems are currently under digital development. The whale and mooring system models will be integrated into simulations to visualize various potential interaction scenarios, including considering associated derelict fishing gear. These simulations will assist BOEM in assessing the risk and potential severity of entanglement, and potentially identify mitigation measures to reduce any risk.
Study Profile: https://espis.boem.gov/study%20profiles/BOEM-ESP-PC-19-x07.pdf
Infographic: https://www.boem.gov/pr-19-ent-infographic

Ongoing (2022–2024) — **Tag you're it! Habitat Use of Whales of the U.S. West Coast and Hawai'i**
This study by Oregon State University and the U.S. Navy will collate and analyze existing whale telemetry data to identify residence times, home ranges, seasonal shifts, hot spots of aggregation, and dive profiles of large whale species to better understand habitat usage. The first phase will focus on the Santa Barbara Channel and areas offshore Hawai'i (specifically around the island of O'ahu). The information garnered about whale occurrence, movements, and behavior will help inform decisions about the siting of offshore floating wind development offshore California and Hawai'i, and the timing of conventional energy decommissioning activities offshore southern California.
Study Profile: https://espis.boem.gov/study%20profiles/BOEM-ESP-PC-22-04.pdf

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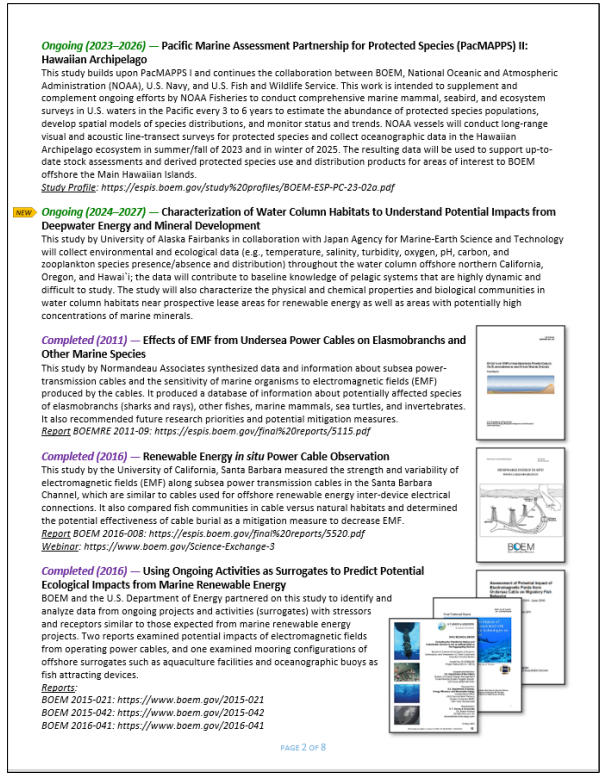

Ongoing (2023–2026) — **Pacific Marine Assessment Partnership for Protected Species (PacMAPPS) II: Hawaiian Archipelago**
This study builds upon PacMAPPS I and continues the collaboration between BOEM, National Oceanic and Atmospheric Administration (NOAA), U.S. Navy, and U.S. Fish and Wildlife Service. This work is intended to supplement and complement ongoing efforts by NOAA Fisheries to conduct comprehensive marine mammal, seabird, and ecosystem surveys in U.S. waters in the Pacific every 3 to 6 years to estimate the abundance of protected species populations, develop spatial models of species distributions, and monitor status and trends. NOAA vessels will conduct long-range visual and acoustic line-transect surveys for protected species and collect oceanographic data in the Hawaiian Archipelago ecosystem in summer/fall of 2023 and in winter of 2025. The resulting data will be used to support up-to-date stock assessments and derived protected species use and distribution products for areas of interest to BOEM offshore the Main Hawaiian Islands.
Study Profile: https://espis.boem.gov/study%20profiles/BOEM-ESP-PC-23-02a.pdf

NEW *Ongoing (2024–2027)* — **Characterization of Water Column Habitats to Understand Potential Impacts from Deepwater Energy and Mineral Development**
This study by University of Alaska Fairbanks in collaboration with Japan Agency for Marine-Earth Science and Technology will collect environmental and ecological data (e.g., temperature, salinity, turbidity, oxygen, pH, carbon, and zooplankton species presence/absence and distribution) throughout the water column offshore northern California, Oregon, and Hawai`i; the data will contribute to baseline knowledge of pelagic systems that are highly dynamic and difficult to study. The study will also characterize the physical and chemical properties and biological communities in water column habitats near prospective lease areas for renewable energy as well as areas with potentially high concentrations of marine minerals.

Completed (2011) — **Effects of EMF from Undersea Power Cables on Elasmobranchs and Other Marine Species**
This study by Normandeau Associates synthesized data and information about subsea power-transmission cables and the sensitivity of marine organisms to electromagnetic fields (EMF) produced by the cables. It produced a database of information about potentially affected species of elasmobranchs (sharks and rays), other fishes, marine mammals, sea turtles, and invertebrates. It also recommended future research priorities and potential mitigation measures.
Report BOEMRE 2011-09: https://espis.boem.gov/final%20reports/5115.pdf

Completed (2016) — **Renewable Energy *in situ* Power Cable Observation**
This study by the University of California, Santa Barbara measured the strength and variability of electromagnetic fields (EMF) along subsea power transmission cables in the Santa Barbara Channel, which are similar to cables used for offshore renewable energy inter-device electrical connections. It also compared fish communities in cable versus natural habitats and determined the potential effectiveness of cable burial as a mitigation measure to decrease EMF.
Report BOEM 2016-008: https://espis.boem.gov/final%20reports/5520.pdf
Webinar: https://www.boem.gov/Science-Exchange-3

Completed (2016) — **Using Ongoing Activities as Surrogates to Predict Potential Ecological Impacts from Marine Renewable Energy**
BOEM and the U.S. Department of Energy partnered on this study to identify and analyze data from ongoing projects and activities (surrogates) with stressors and receptors similar to those expected from marine renewable energy projects. Two reports examined potential impacts of electromagnetic fields from operating power cables, and one examined mooring configurations of offshore surrogates such as aquaculture facilities and oceanographic buoys as fish attracting devices.
Reports:
BOEM 2015-021: https://www.boem.gov/2015-021
BOEM 2015-042: https://www.boem.gov/2015-042
BOEM 2016-041: https://www.boem.gov/2016-041

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https://www.boem.gov/selected-boem-research-renewable-hi-pt

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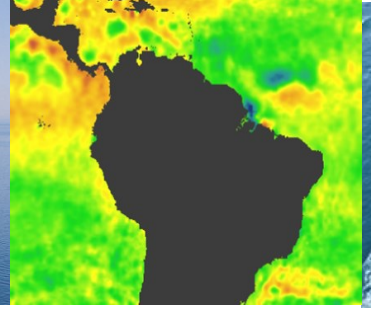
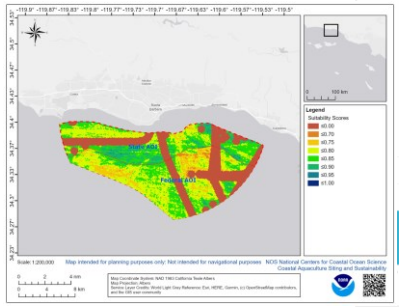
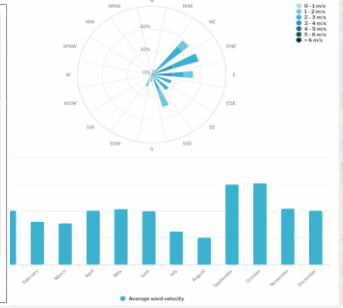
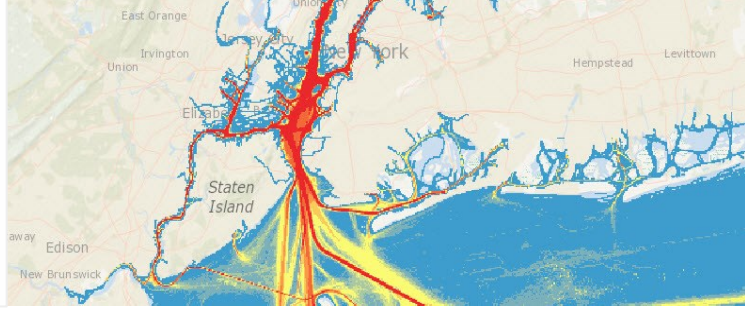
www.boem.gov/Guam

Ocean spatial modeling for siting of wind energy: How NOAA is providing Marine Spatial Planning support

NCCOS Spatial Planning Team
James.Morris@noaa.gov

NCCOS | NATIONAL CENTERS FOR COASTAL OCEAN SCIENCE

NOAA BOEM MSP Partnership

National Oceanic and Atmospheric Administration
U.S. Department of Commerce

Home / News & Features

NOAA and BOEM announce interagency collaboration to advance offshore wind energy

HOME | NEWSROOM

BOEM Enhances its Processes to Identify Future Offshore Wind Energy Areas

New Changes in Response to Public Input

09/16/2022

BOEM
Bureau of Ocean Energy Management

NOAA

PERMITTING DASHBOARD
FEDERAL INFRASTRUCTURE PROJECTS

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U.S. DEPARTMENT OF ENERGY
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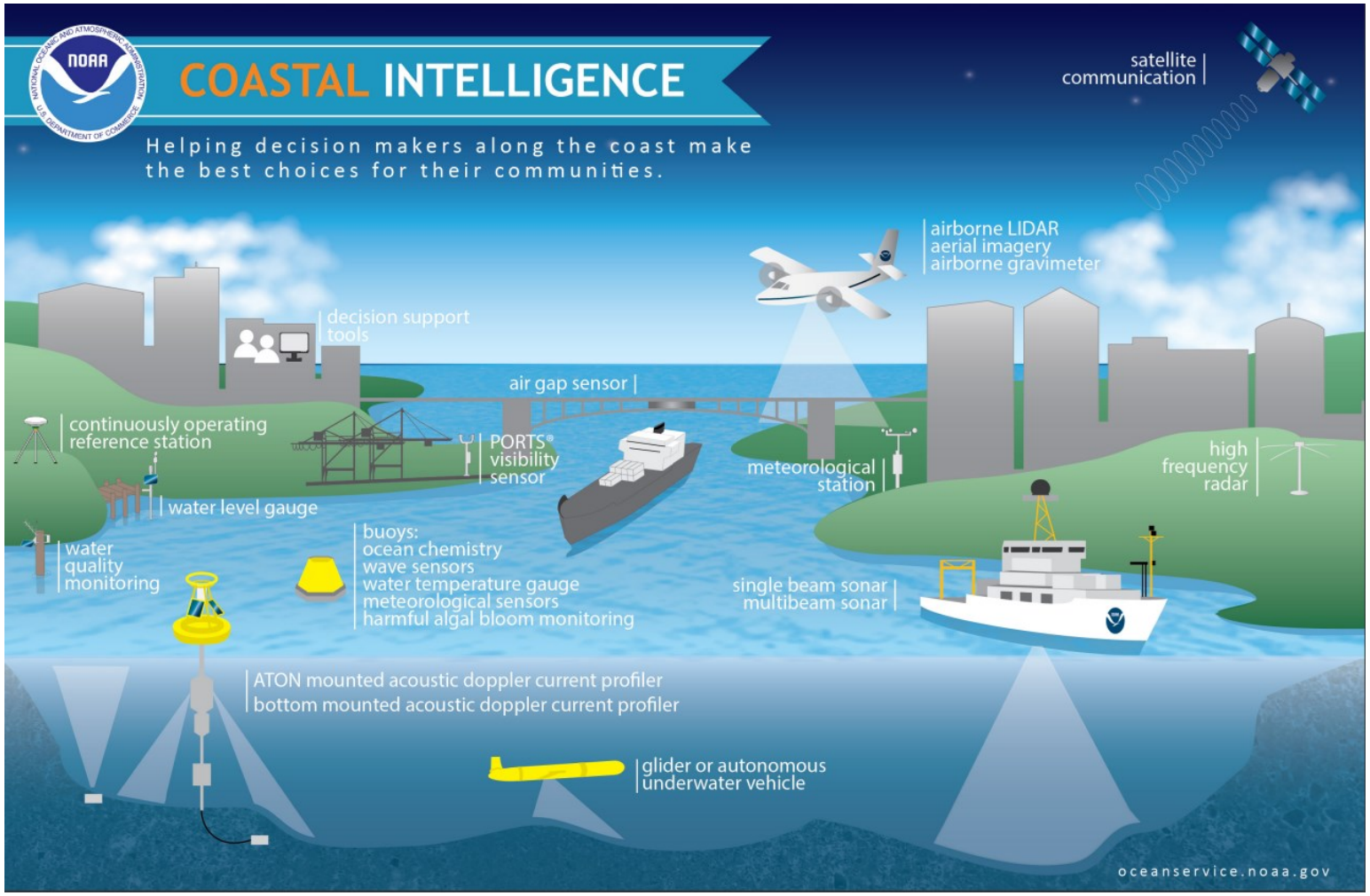
CHANGING WHAT'S POSSIBLE

NOAA Leads the Nation on Ocean Intel

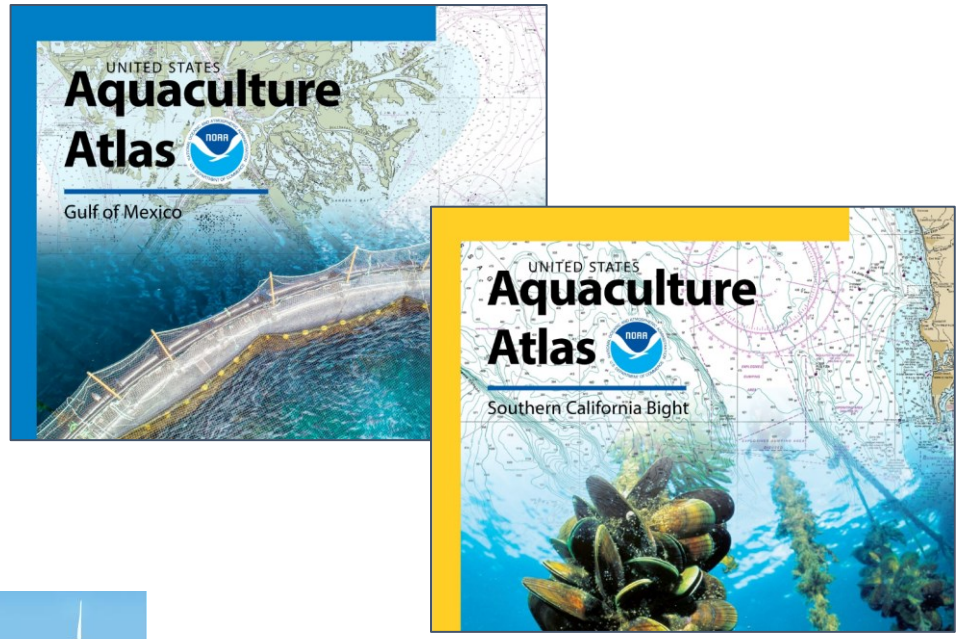


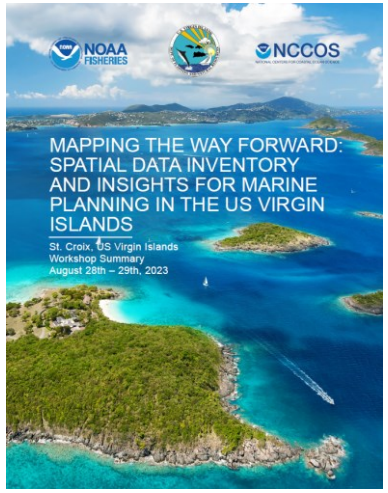
Ocean Industries

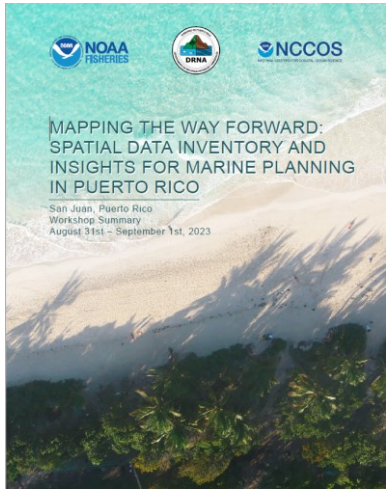
- Tourism and Recreation
- Defense and Public Administration
- Offshore Oil and Gas
- Transportation
- Fisheries and other Bio-products
- Shipbuilding
- Power Generation
- Construction
- Research and Education
- Professional and Business Services*

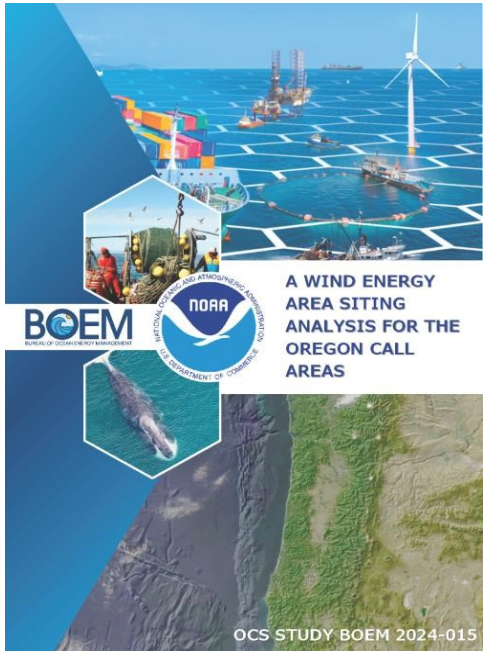
NOAA Spatial Planning

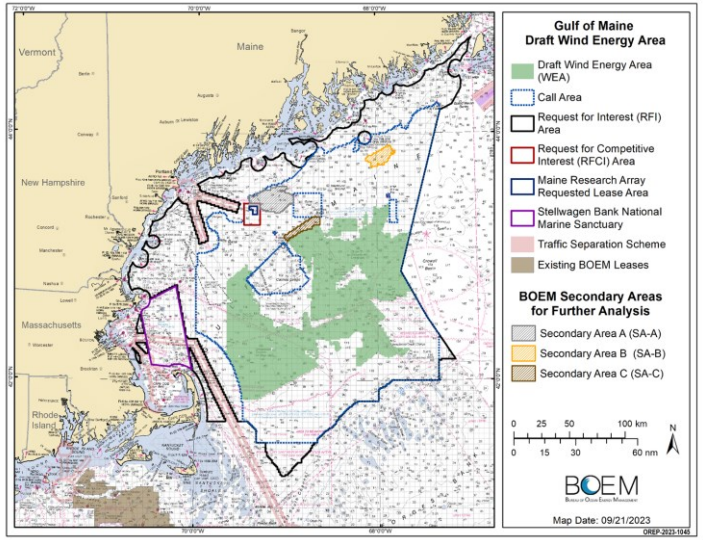
- Facilitation of the MSP process
- Completed 50+ analyses in last 5 years
- Identified Aquaculture Opportunity Areas
- Identified Wind Energy Areas
- State-designated aquaculture use areas
- Spatial planning for Ports/Harbors
- Tool/app development
- Stakeholder engagement





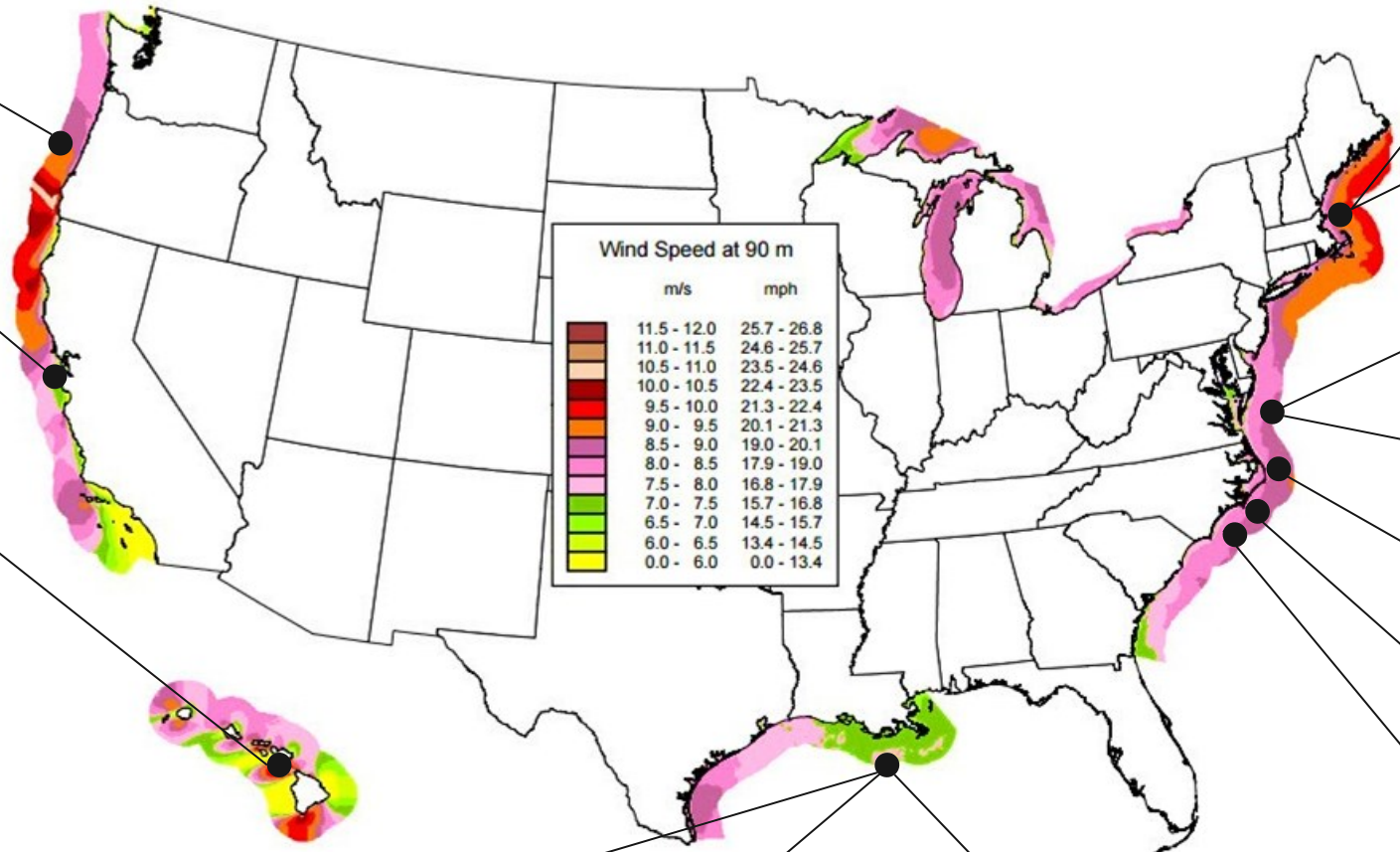






NOAA BOEM Spatial Planning

United States - Annual Average Offshore Wind Speed at 90 m



Oregon
Wind energy area siting ✓
Lease siting ✓

California #2
Call area siting
Wind energy area siting
Lease siting

Hawaii
Call area siting
Wind energy area siting
Lease siting

Guam
Call area siting
Wind energy area siting
Lease siting

Gulf of Maine
Call area siting ✓
Wind energy area siting ✓
Lease siting ✓
Cable siting

Stellwagen Bank NMS
Cable corridors

Central Atlantic 1
Wind energy area siting ✓
Lease siting ✓
Cable siting

Central Atlantic 2
Call area siting
Wind energy area siting
Cable siting

Kitty Hawk
Cable siting

Cape Lookout NPS
Cape Hatteras NPS
Cable corridors

Carolina Long Bay
Cable siting

Gulf of Mexico 1 ✓
Wind energy area siting ✓
Lease siting
Cable siting

Gulf of Mexico 2 ✓
Wind energy area siting
Lease siting
Cable siting

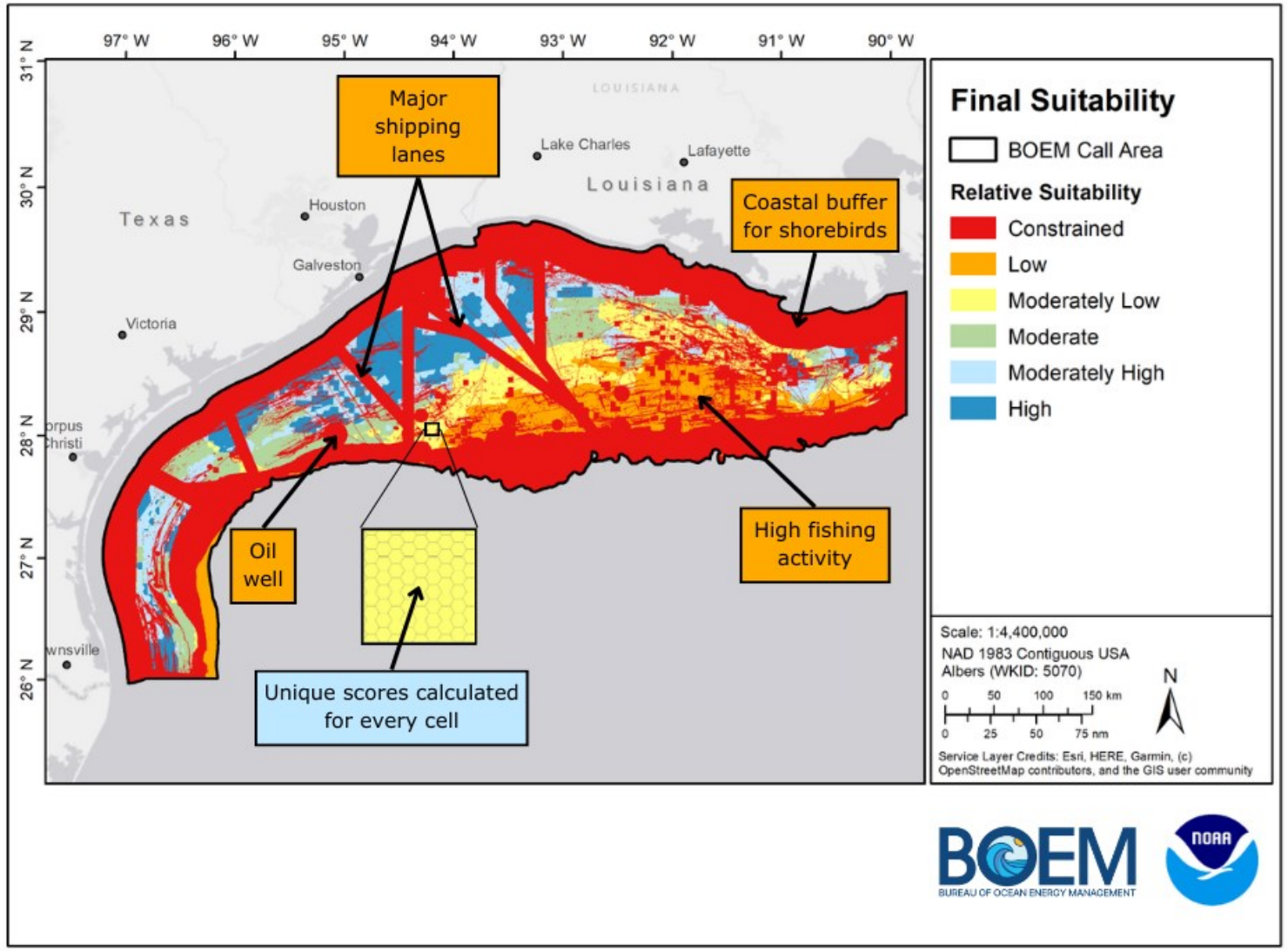
Gulf of Mexico 3 ✓
Call area siting
Wind energy area siting
Lease siting
Cable siting

Puerto Rico
Call area siting
Wind energy area siting
Lease siting
Cable siting

Map credit: NREL

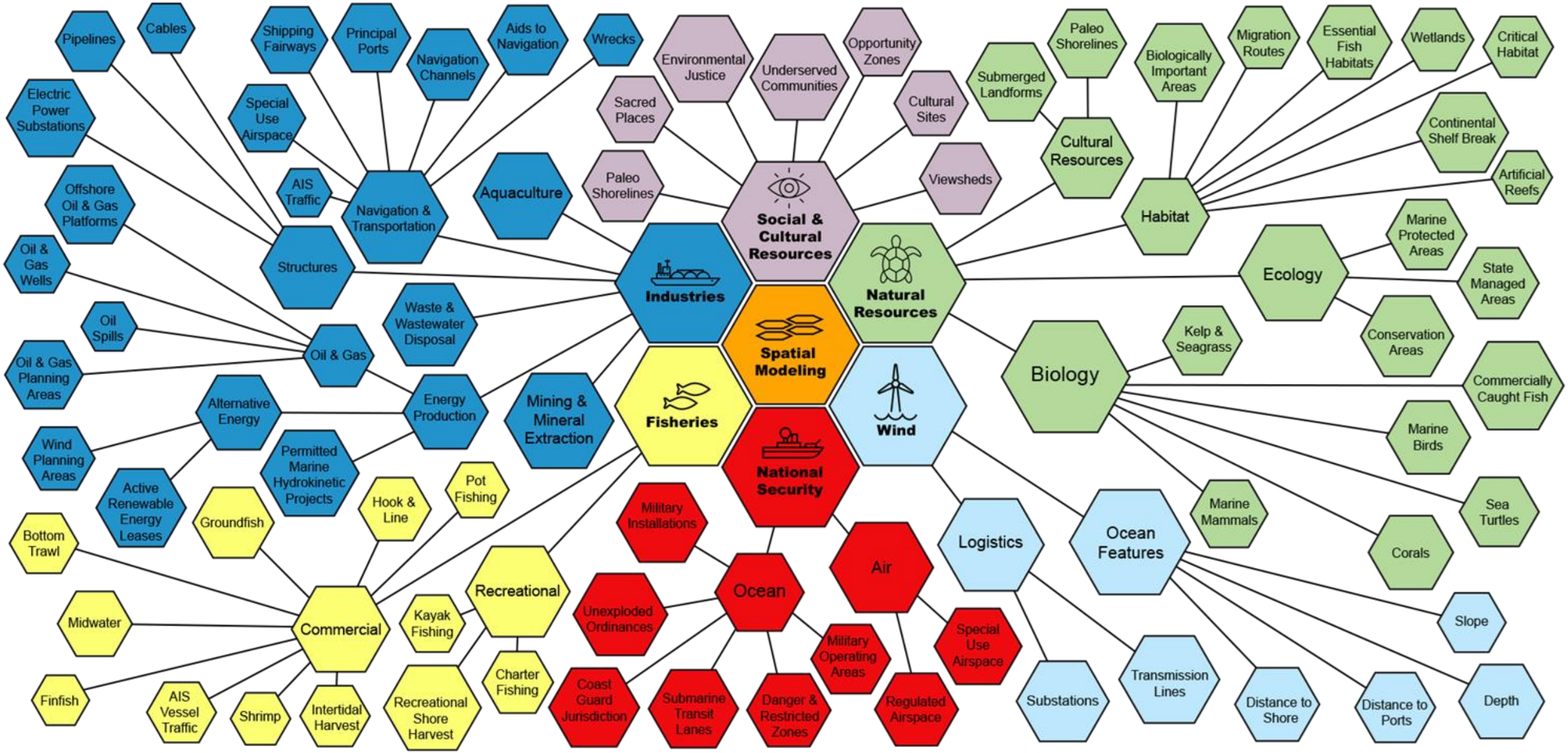
BOEM BUREAU OF OCEAN ENERGY MANAGEMENT

Our Goal: Identify Conflict, Find *Opportunity*



A **spatial suitability model** weights locations relative to each other based on given criteria.

Ecosystem Models Require an Ocean of Data



How do we build the regional spatial model?

OROWindMap
Supporting the Offshore Wind Planning Process in Oregon

MarineCadastre.gov
An Ocean of Information
A joint BOEM and NOAA initiative providing authoritative data to meet the needs of the offshore energy and marine planning communities.

NOAA FISHERIES

NATIONAL WEATHER SERVICE

BOEM
Bureau of Ocean Energy Management

OREGON Fish & Wildlife

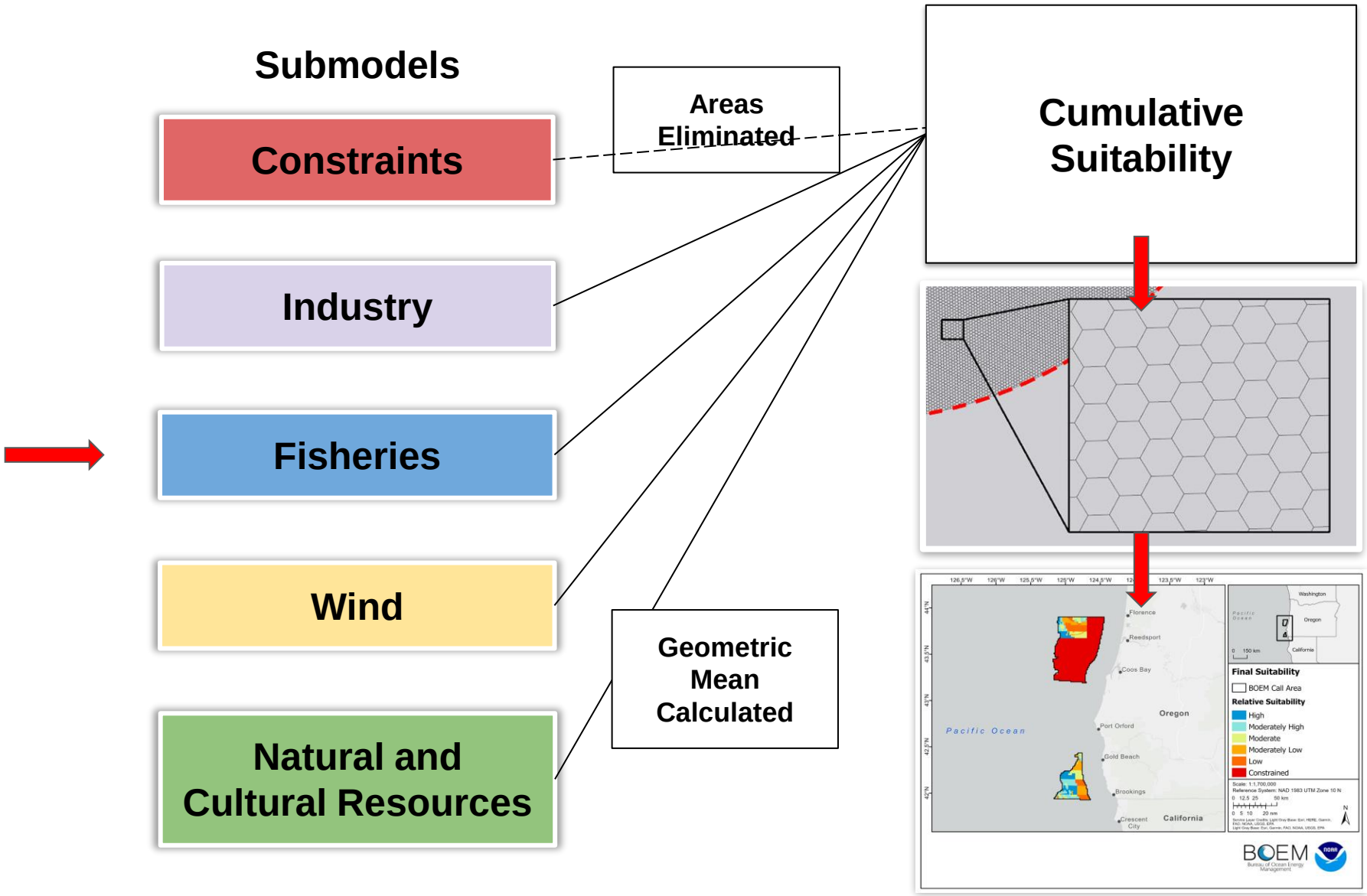
NCCOS

PACIFIC FISHERY MANAGEMENT COUNCIL

State Agencies

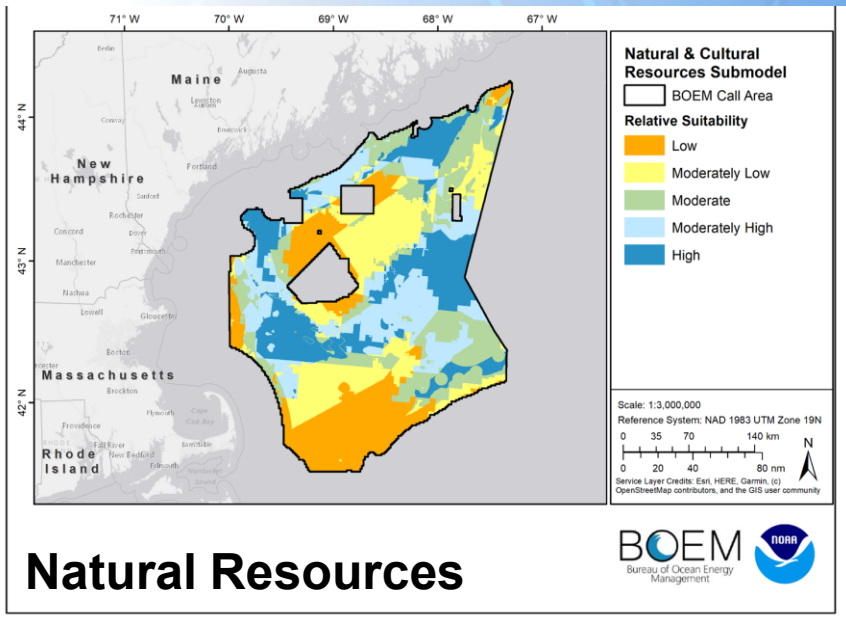
USGS science for a changing world

NREL
NATIONAL RENEWABLE ENERGY LABORATORY

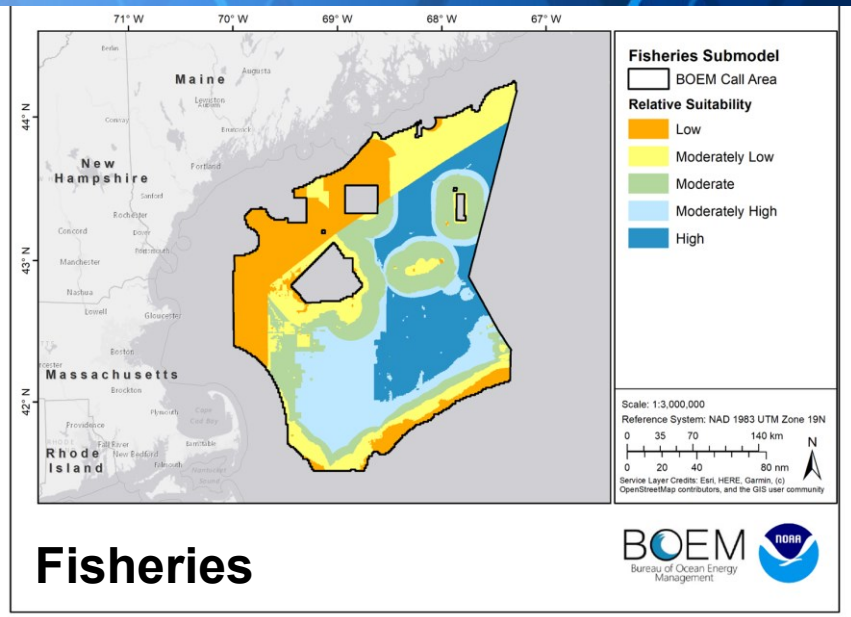


Example

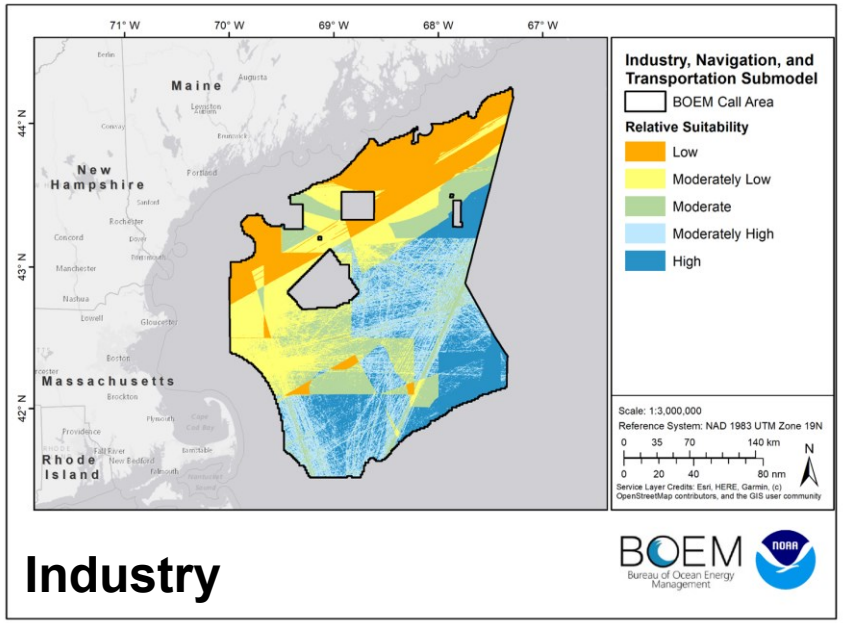
Submodel suitability results: Gulf of Maine



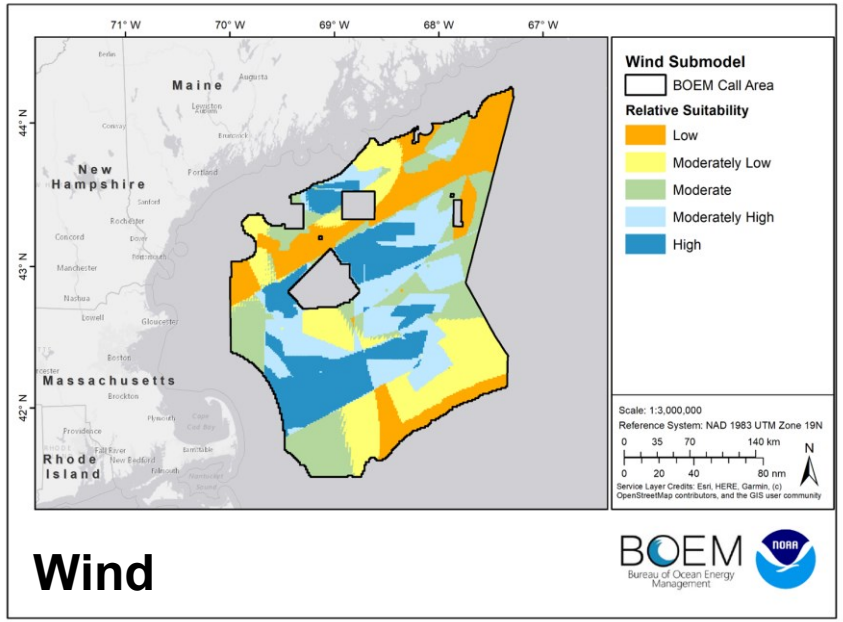
Natural Resources



Fisheries

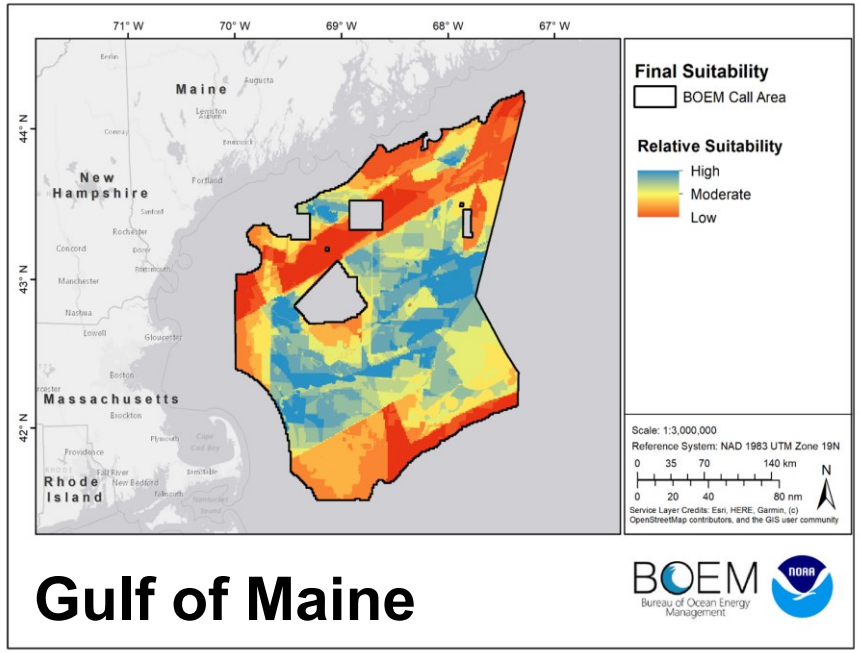


Industry

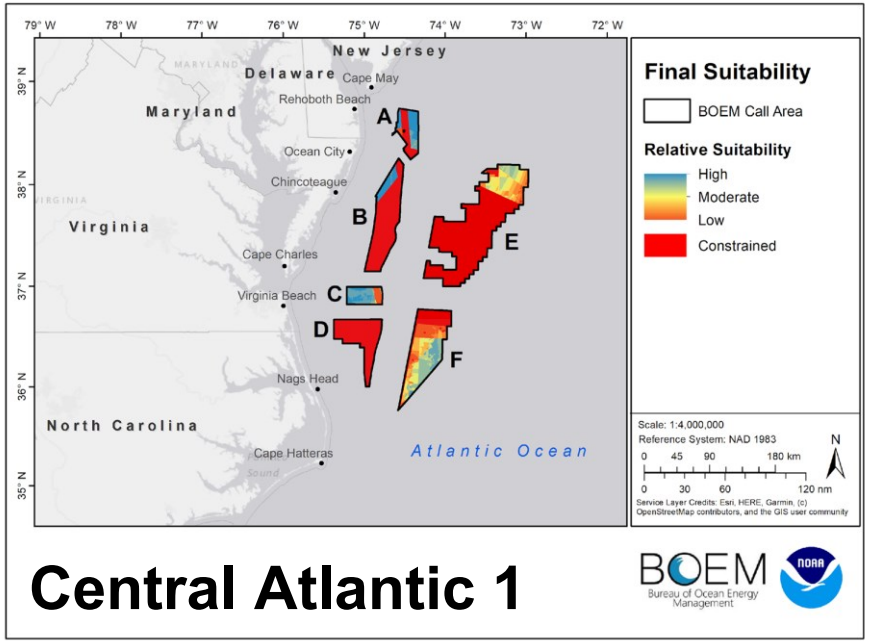


Wind

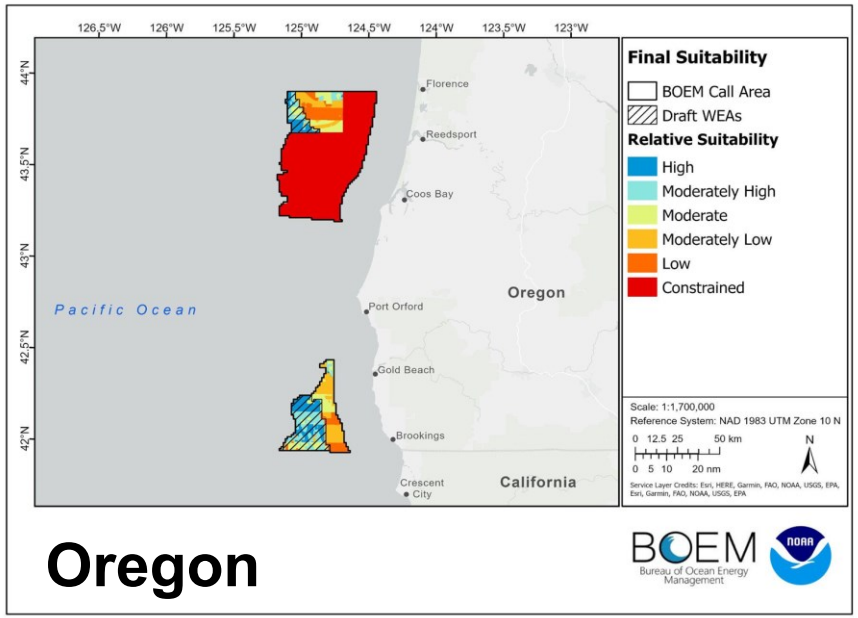
Regional suitability modeling results



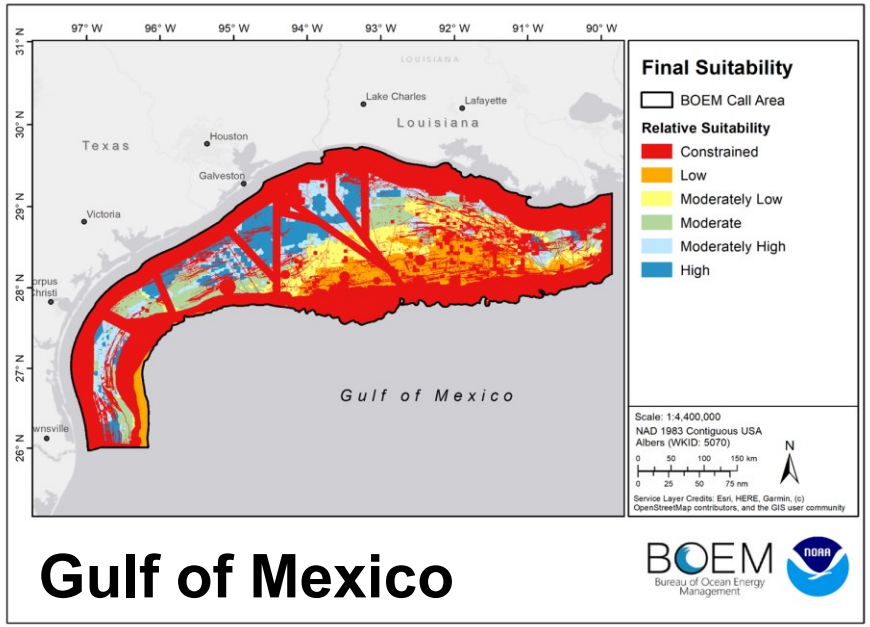
Gulf of Maine



Central Atlantic 1



Oregon



Gulf of Mexico

National Centers for Coastal Ocean Science
National Ocean Service

Your OceanFuture Starts Here

Spatial science for ocean food, energy, commerce, and conservation

Thank you!
For more info:
James.Morris@noaa.gov

Clarifying Questions on BOEM Studies and NCCOS Presentations

Instructions – Task Force Members

- Mute yourself when not speaking.
- To enter the discussion queue:
  - **Place your name card on its side.** Please lower your card once you are done speaking.
  - **Use the "Raise your hand" button or press *9 on your phone.** Please lower your hand once you are done speaking.
    - If unable to speak, use the chat for technical assistance. Refrain from sidebar conversations.
- Task Force members are encouraged to keep their webcam on during introductions and discussions.

Break

Please return at 1:55 p.m. ChST

Other Task Force Member Comments and Discussion

Instructions – Task Force Members

- Mute yourself when not speaking.
- To enter the discussion queue:
  - **Place your name card on its side.** Please lower your card once you are done speaking.
  - **Use the "Raise your hand" button or press *9 on your phone.** Please lower your hand once you are done speaking.
    - If unable to speak, use the chat for technical assistance. Refrain from sidebar conversations.
- Task Force members are encouraged to keep their webcam on during introductions and discussions.

Closing Remarks

Closing Remarks

Doug Boren, BOEM Pacific Regional Director

Closing Remarks

Lester Carlson, Director, Bureau of Budget Management and Research

Break

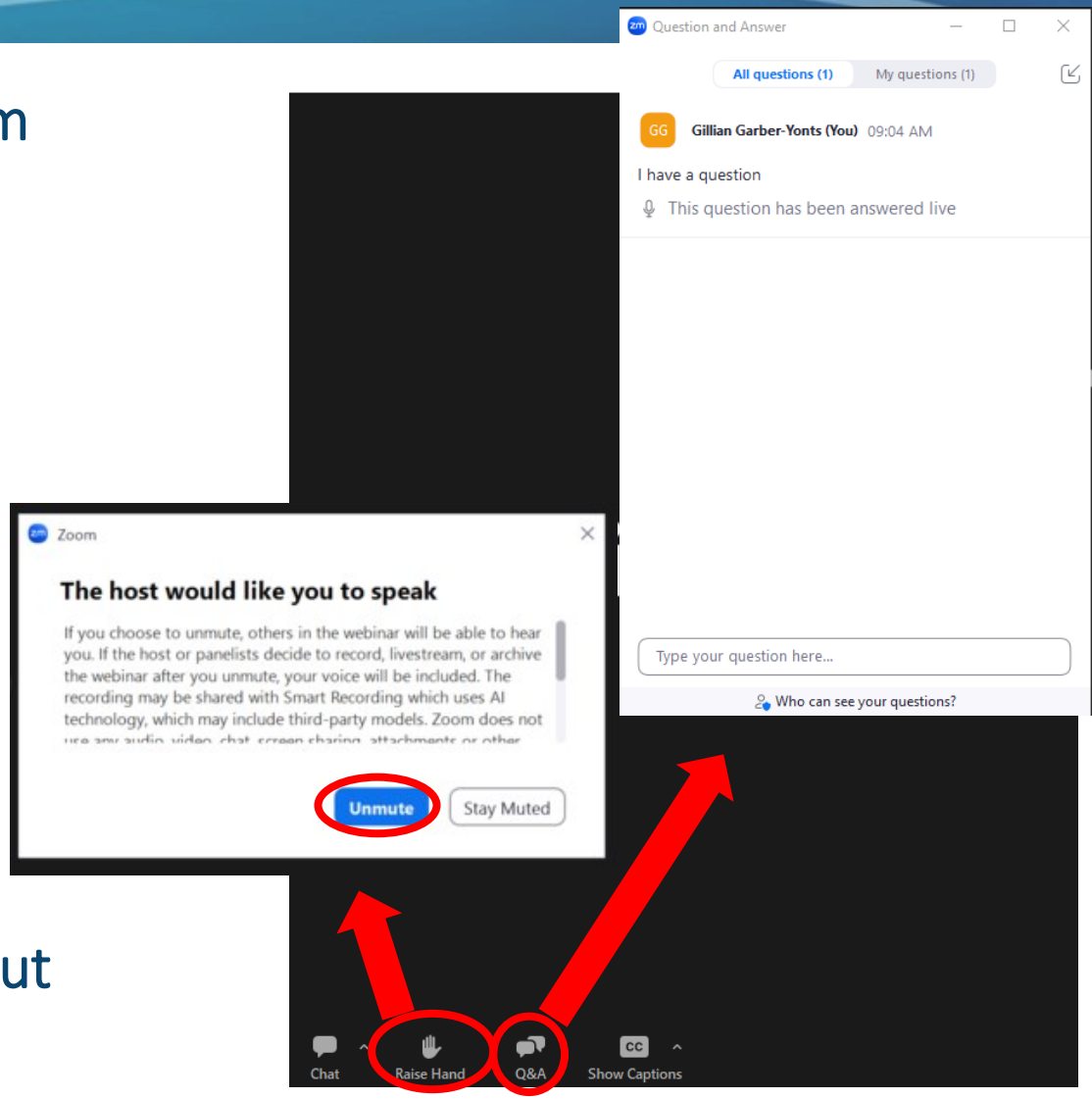
Please return at 3:00 p.m. ChST

Task Force Meeting Adjourn

Opportunity for Public Perspectives and Questions

Instructions - Public Perspectives and Q&A

- We will go back and forth between those in the room and those online.
- Note that this time is not official public record.
- Discussion should relate to topics the Task Force items.
- To enter the queue:
  - Get a number at the sign-in table.
  - Use the raise hand button or press *9.
- Please be mindful of speaking time.
  - One question per person
- Due to time constraints, you may submit written input via a card at the sign-in table or the Q&A pod.



BOEM

BUREAU OF OCEAN ENERGY MANAGEMENT

BOEM.gov

Thank you!